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American Schools of Oriental Research

JERUSALEM BAGHDAD

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FIFTIETH ANNUAL REPORT OF THE PRESIDENT

To the Corporation and the Board of Trustees of the American Schools of Oriental Research:

GENTLEMEN,

Once again I have the honor to report to you on the corporate life of the American Schools and to state that our affairs are being administered conscientiously and that our work progresses. Credit for this state of affairs goes above all to those who, as the representatives of our member institutions, elected to office by you, have discharged their duties with

exemplary and unfailing devotion. You continue to have the services of an active administrative group, of two able committees charged with responsibilities for the Schools of Jerusalem and Baghdad respectively, of editors who keep your publications at high levels of scholarship, of competent Directors in and off the field, of a far-sighted Finance Committee, of an invaluable Business Manager, of loyal helpers at Jerusalem and at home and of a host of friends in all parts of the country.

During the current year three institutions have been elected to membership in the corporation:

Church Divinity School of the Pacific, Berkeley, Calif.
Evangelical & Reformed Church Theological Seminary (Lancaster, Penna.)
Northwestern Lutheran Theological Seminary, Minneapolis, Minn.

We are happy indeed to welcome them and their representatives to participation in our efforts. Corporation membership now stands at 84 and individual memberships at 687.

Financially we are still drawing upon goodly reserves accumulated during the war years and thus not living within our immediate income from invested funds and contributions. In this particular we have not as yet matched the standards properly set for us by a special committee of the Trustees headed by Dr. Donald Scott, but by reason of special circumstances connected with the life of the Baghdad School our expenditures will be approximately $16,000 less than was budgeted for the fiscal year 1952-53, leaving so much more of our reserves intact. It is a question whether under existing conditions we shall ever be able actually to live within our regular income of about $34,000.00 per annum, for costs of publication, of salaries and wages, of travel and of overseas operations are advancing materially and continually. We must therefore ask ourselves whether within the foreseeable future it will not be necessary for us to seek such help as was given by foundations in the years 1930-40 and to try to increase our endowment from its present level of approximately $400,000.00 to a figure closer to $600,000.00.

We shall need to consider more immediately and with some care the further development of the Baghdad School. Current administrative procedure in Iraq as outlined by Dr. Naji al-Asil in *Sumer* VIII, 1 (1952), pp. 108-109, seems to preclude the possibility of our attaining there in the foreseeable future those goals that led to the creation of the Baghdad School in 1921 upon the invitation that came to us from King Feisal I through Gertrude Bell. For the part of the Baghdad School income not now applied to purposes such as the publication of the *Journal of Cuneiform Studies*, a better use must be found than the Annual Professorships awarded in recent years. We must await in this connection the recommendations of the Baghdad School Committee.

At Jerusalem we are trying to work out with the municipality proper arrangements for allocating the cost of widening the street along the north side of our property, as proposed by it. At the same time we are endeavoring to arrange for our staff a system of accumulating retiring

allowances or mustering-out pay, to avoid sudden and unexpected drains on current funds. We are happy to say that the library of the School has now been covered by insurance. As our publications for the current year indicate, the work in the field administered by Drs. Reed and Cushingham has been most effective and the joint operation with the British School under Miss Kenyon's direction a great success. In the matter of the caves in the Dead Sea region the Jordan Department of Antiquities is facing a real crisis. The question is what can and should the American Schools do to assist Mr. Harding in this connection.

The Museum is proving an invaluable help in handling the material already produced by the Qumrân and Murabba'ât areas, but there is need of Aramaists who can join the Dominicans in the interpretation of the material at Jerusalem.

At home preparations for the publication of the reports of Dr. Sellers and Dr. J. L. Kelso on their excavations are well advanced. It is hoped that the work done at Dhībân may be reported upon briefly each year in separate *Supplementary Studies*. Under the supervision of Dr. Alsoph H. Corwin a chemical experiment is being conducted at Johns Hopkins University to ascertain whether the copper scrolls found in the Qumrân cave by the members of the Jerusalem School staff last spring can be made pliable in spite of their completely oxidized state. The results of this experiment will show whether the scrolls must be cut into strips to give access to their text or whether their original form can be preserved.

In one particular we are, in spite of repeated efforts, not serving member institutions properly. This is in the preparation of loan materials for use in their educational work. We have had to withdraw from circulation the older of our slide lectures as being completely outdated and no longer satisfactory. Efforts made to obtain photographic material for the preparation of new slide lectures through appointees to the school staffs have not been signally successful, for such appointees usually have their hands full whether as learners or as participants in archaeological field work. Yet here is a field in which we must supply materials, not only on current excavations but also on subjects of general interest, if we are to serve our constituency properly. We may have to make a separate project of our effort to supply the material and finance it moderately if we are to return to the standards that were set during Dr. Glueck's days in this particular.

Respectfully submitted,

CARL H. KRAELING

Chicago, November, 1952.

REPORT OF THE DIRECTOR OF THE SCHOOL AT BAGHDAD

To the President and Trustees of the
American Schools of Oriental Research:

The report of the Baghdad School covering the year 1951-52 is unfortunately short. It will be remembered that we had great plans for this year, but at the last moment it became clear that they could not be realized.

During 1951-52 we were represented in Baghdad by Professor Francis R. Steele of the University of Pennsylvania. Our Annual Professor for 1952-53, Dr. Alexander Heidel of the University of Chicago, has just reported his safe arrival in Iraq. He was received with utmost courtesy by the Director of Antiquities of the Government of Iraq, Dr. Naji al-Asil, and the members of his staff. He has commenced work in the Iraq Museum.

The Journal of Cuneiform Studies runs on schedule. It has completed its fifth volume and the sixth volume is now in its third issue, with the final issue in print.

ALBRECHT GOETZE

New Haven, Connecticut
November 3, 1952.

REPORT OF THE DIRECTOR OF THE SCHOOL IN JERUSALEM

To the President and Trustees of the
American Schools of Oriental Research:

I have the honor to submit the following report on the activities of the Jerusalem School for the academic year 1951-52.

My services with the School began in July 1951 when the general program for the year was outlined in a series of conferences in Chicago with President Carl H. Kraeling and Professor A. H. Detweiler, Chairman of the Jerusalem School Committee. Whatever success was achieved during the year was due in no small measure to the counsel of these two officials of the School whose wisdom and experience made it possible to plan adequately the activities of the year.

When my wife, son and I arrived in Beirut on August 22 we were met by Professor A. D. Tushingham who had been serving the School as Acting Director since the departure of Professor Fred V. Winnett in June. Imran Abdo, School chauffeur, was also present in Beirut to greet us. With Imran at the wheel of the Pontiac station-wagon, the trip to Jerusalem via Damascus was made without difficulty. Supplies for the School which had been ordered by Mrs. Kraeling and had accompanied us from New York City were transported in the station-wagon, but two large cases had to be shipped from Beirut to Jerusalem by Amlevco.

On September 1, after a few days of instruction in the business affairs of the School by Professor Tushingham, I assumed the duties as Director, and Mrs. Reed took over responsibility for the secretarial and book-

keeping work at the School. The School buildings and grounds were in excellent condition when we arrived; a minimum of maintenance was required to keep them in good shape during the year.

School trips and individual study started during September when the students began to arrive from the United States. Classes met for the first time during the first week in October, but the new academic year was launched officially on October 11 with a tea and reception for the students and staff at which there was an opportunity to meet approximately ninety persons from the various religious, scholarly and official groups of Arab Jerusalem.

Professor A. D. Tushingham, who was joined by his wife, Mrs. Margaret Tushingham, in February, was the Annual Professor, and also the Librarian at the School until the beginning of the excavations at Jericho. Miss Sirarpie Der Nersessian, Professor of Byzantine Art and Archaeology at Dumbarton Oaks, was honorary visiting lecturer at the School during the year. She and her sister, Mrs. A. Der Nersessian, occupied the Annual Professor's apartment until their departure in April, and together they photographed and studied several hundred Armenian manuscripts at the Armenian Patriarchate in the Old City.

At various periods during the year the following were students at the School: Dr. E. W. Hamrick from Duke University, Fellow of the School; Dr. Victor Gold from Johns Hopkins University, also a Fellow of the School; Professor James B. Storey from Austin College; Mr. Gus Van Beek from Johns Hopkins University, who arrived in February to take up the Fellowship which Dr. Gold relinquished in December; Father Robert North from the Pontifical Institute, Rome, Honorary Fellow; Awni Dajani, Inspector of the Jordan Department of Antiquities; and Dr. Edwin H. Broome, Jr. In addition, several other members of the Schools, during brief periods of residence in the hostel, attended lectures and seminars, and participated in School trips.

With the generous cooperation of Professors Tushingham and Der Nersessian it was possible to schedule several seminars and lectures during October, November and December in which various aspects of archaeology were treated. Prior to trips to various archaeological sites, students and staff members prepared oral reports based on a study of the publications relating to these sites. Studies of pottery, flints, scarabs, coins and other objects in the Palestine Archaeological Museum were made possible by Mr. G. Lankester Harding, Acting Curator, and Mr. Joseph Sa'ad, Secretary, who made available to all School personnel the marvelous resources of the Museum.

The employees of the School deserve every commendation for their efficient work during the year. The comfort and the good health of School personnel were due largely to the loyal and intelligent service of the employees, Omar, Helen, Melia, Mahmud, Imran and the Haj. The School group was shocked and saddened at the sudden death of Helen Christaki, assistant cook and housekeeper, on December 5. Everything possible was done for her during her brief illness, and for her family in the months that followed. Her son, Benny Christaki, was employed

as assistant cook during the remainder of the academic year and was most helpful at both the Jericho and the Dhībân excavations.

Having the use of two School automobiles, both of which were in good mechanical condition, it was possible to plan and to carry out extensive School trips in Jordan, Syria and Lebanon. The trips took place during the period from September 1 to January 1, and again during the month of June. One trip took the group to Damascus, Palmyra, Homs and Aleppo, with a brief visit to Antakia and environs in Turkey, and to Ras Shamra, Latakia, Tripoli, Beirut and Baalbek. Another trip during November covered the important archaeological sites between Jerash and 'Aqabah and included among others, visits to Kerak, Petra, Wadi Ram, and Tell el-Kheleifeh. Nearly all the sites in west Jordan that were accessible by car, and some that could be reached only on foot were visited on trips which were open to all School personnel.

During the period from January 1 to June 1 the School was involved in three projects in the field. The first was at Jericho where the School joined with the British School of Archaeology in the excavations at Tell es-Sulṭân. The joint operation was directed most ably by Miss Kathleen Kenyon, Director of the British School, who was assisted by Professor Tushingham. A camp was set up directly east of the *tell* near 'Ain es-Sulṭân, and work continued for a period of approximately twelve weeks. Professor Tushingham, Mrs. Tushingham, Dr. Hamrick, Mr. Van Beek, Father North and I represented our School for various periods during the excavations on a staff which at times numbered twenty-five persons. Several soundings on the *tell*, and the excavation of a number of tombs in the village north of the *tell*, yielded important results for the Middle Bronze and earlier periods. The preliminary reports already published by Miss Kenyon and Professor Tushingham have indicated some of the significant results of this first season of joint operations, and it is gratifying to know that a second season is planned.

When the sounding for which I was responsible at Tell es-Sulṭân was completed early in March, it was possible for me to accept, in behalf of our School, the invitation of Mr. Harding, Director of the Department of Antiquities in the Hashemite Kingdom of the Jordan, to participate in the excavation of approximately forty caves in the vicinity of Khirbet Qumrân located near the northwest shore of the Dead Sea. The operation was designated as the Qumrân Caves Expedition and was conducted jointly by the École Biblique, the Palestine Archaeological Museum, and our School. Père R. de Vaux and I shared the responsibility of directing the work; the staff included Père D. Berthélemy, Père J. T. Milik, and Mr. Henry de Contenson of the French School, Azmi Khalil and Ibrahim Assula of the Museum, and Hasan Awad Qutshan of Amman.

The caves, some of which were located within 100 metres of the cave that contained the famous Dead Sea Scrolls, were found to contain pottery similar to that known from the first cave. Fragments of parchment manuscripts were found in two of the caves. In one of them were discovered two sheets of tightly rolled copper about 2.40 metres in length which were inscribed on the inside with Hebrew characters. The responsibility for unrolling the copper sheets was assumed by the Jordan

Department of Antiquities through the Director, Mr. Harding. Dr. W. F. Albright has given invaluable advice and has arranged for experiments which are aimed at devising a method for unrolling the copper sheets. The responsibility of restoring the pottery has been assumed and the work already started, by the Palestine Archaeological Museum, and it is hoped that a preliminary report will be possible in the near future.

The final project of the School took place during April and May at Dhībân, ancient Dībôn, one time capital of Moab. Excavation was carried on in the so-called " Gateway Area " located at the southeast corner of the *tell* where a sounding had been made during the first season under the directorship of Professor Winnett. Remains of occupation during the Arab-Byzantine, Roman-Nabataean and Iron Age periods were discovered in this area, but no fortified gateway was found. A search for tombs was conducted on the side of a *wâdī* about 200 metres east of the *tell*, and resulted in the discovery of one grave, one collapsed tomb which had evidently not been occupied, and another tomb which had been used during the Eighth-Ninth Century B. C., although it had been disturbed after the latest burial had been made.

It was my responsibility to direct the excavation at Dhībân during this second season, and it was a privilege to be associated with an excellent staff which included Professor Tushingham, Mr. Gus Van Beek, Mr. Peter Pedrette, Hasan Awad Qutshan, Jamil Albina, and for brief periods, Dr. J. P. Free and Dr. E. H. Broome, Jr. Some of the pottery from Dhībân is being restored in the Museum at Amman, and a selection of sherds, pottery and other objects has been brought to the United States for study. It is expected that the preliminary studies will be completed in the near future and that a preliminary report of the work at Dhībân may soon be published.

It may be reported that accomodations were provided by the School for all members of the School who made application during the year. Approximately 75 persons resided in the School Hostel for periods of time ranging from several days to several months.

President Kraeling's visits during May came at a most opportune time as the work of the year was drawing to a close and preparations were being made by Professor Tushingham to take up his duties as Director on July 1. I am indebted to President Kraeling for his counsel, and also to Professor Detweiler and Professor Albright, whose letters were always a source of encouragement and help. As in former years, Mr. Harding and Père de Vaux were exceedingly generous and cooperative in the field activities of the School.

On July 8 I departed from Jerusalem by plane with my family for Beirut. I wish to thank the Trustees for the honor which they conferred on me in appointing me to serve as Director of the Jerusalem School for the year 1951-52. My associations with the School will always be a source of pleasant memories.

Respectfully submitted,

WILLIAM L. REED

Fort Worth, Texas
November 8, 1952

ANNUAL FINANCIAL REPORT OF THE AMERICAN SCHOOLS OF ORIENTAL RESEARCH

FOR THE YEAR ENDING JUNE 30, 1952

INCOME

Income from Investments			
General Endowment		$15,091.59	
Henry Thatcher Fowler Memorial		22.96	
Helen M. Moulton Memorial		229.56	
Edward T. Newell Fund		229.56	
Edward Robinson Fund		859.58	
Ann E. Stodder Fund		160.69	
Jastrow Memorial		35.00	
John P. Peters Memorial		12.50	
Schofield Memorial		12.50	
Reserve for Research		319.88	
Felix M. Warburg Reserve		270.00	
J. B. Nies Reserve		412.50	$ 17,656.32
Income from J. B. Nies Estate			
For General Use	$2,580.80		
Applied on Cost of Publications	2,086.74	4,667.54	
For Publications		141.36	4,808.90
Contributions, etc.			
Corporation Dues		8,000.00	
Associate Memberships		3,667.00	
Other Memberships		500.46	
Patrons		200.00	12,367.46
Special Contribution			
For Jericho Excavation			5.00
Income from Publications, etc.			
The Annual		1,203.05	
Biblical Archaeologist		2,755.72	
Bulletin and Supplementary Studies		2,032.39	
Journal of Cuneiform Studies		872.76	
Other Publications		971.86	
Dead Sea Scrolls		1,401.18	
Trade Publications		1,621.24	
Educational Materials		46.50	10,904.70
Appropriations from Reserves			
Reserve for Research		6,000.00	
J. B. Nies Reserve		6,200.00	12,200.00
Income Received in Jerusalem			
School & Hostel Income		6,999.00	
Archaeological Account Income		342.91	7,341.91
Miscellaneous Income			
Royalties		69.84	
Refund on Cuneiform Texts		33.00	102.84
Additional Receipts			
Refunded by Fogg Museum re Scroll Project		997.45	
Refunded on former Appropriation Toward Baghdad School		275.00	1,272.45
Total Income			$ 66,659.58

EXPENDITURES

Jerusalem School			
Director's Salary		$ 5,000.00	
Director's Travel Allowance		1,100.00	
Acting Director's Salary		1,125.00	
Annual Professor's Salary		2,558.31	
Annual Professor's Travel Allowance		550.00	
Books, Supplies, etc.		977.80	
Insurance		270.42	
Fellowships—Board & Lodging		2,200.00	
Fellowships—Travel Allowance		1,620.00	
Operation of School (Paid in Jerusalem)		10,764.43	$ 26,165.96
Archaeological Account			
Equipment Bought		721.51	
Expenditures in Jerusalem		3,835.95	4,557.46
Baghdad School			
Annual Professor's Salary			500.00
Publication Costs			
Bulletin and Supplementary Studies		2,713.16	
Biblical Archaeologist		3,029.06	
Journal of Cuneiform Studies			
From General Funds	$1,000.00		
From J. B. Nies Income	2,086.74	3,086.74	
Educational Material		54.00	
Trade Publications		883.44	
Other Publications		84.96	9,851.36
Administration			
Salary (Business Manager)		2,670.00	
Office Help		2,033.50	
Supplies		1,293.78	
Telephone and Telegraph		121.10	
Postage and Express		975.37	
Bank Charges		69.00	
Costs of Acquiring Travelers Checks		195.00	
Insurance (New Haven)		53.84	
Audit Expense (New Haven)		25.00	
Miscellaneous		11.30	
Trustees' Travel Expense		299.24	
President's Travel Allowance		489.52	
President's Secretarial Expense, etc.		344.90	
Audit Fee (Philadelphia)		75.00	
Cost of Trustees' Meeting		101.19	
Assistant Treasurer's Fee		1,800.00	10,557.74
Social Security Costs (Employer's Share)			208.38
Additional Charges			
Refunded Zion Research Foundation Contribution		1,000.00	
Fellowship in Israel		2,200.00	
Appropriation Toward Unrolling Scrolls		250.00	3,450.00
Total Expenditures			$ 55,290.90

FINANCIAL STATEMENT

ASSETS

Cash		
For Current Use	$ 9,238.53	
Awaiting Investment	430.75	
Held in Reserve	437.92	$ 10,107.20
Investments (Market Value 6/30/52—$493,888.80)		430,579.11
Furnishings and Equipment		4,601.46
Buildings		69,432.00
Real Estate in Jerusalem		27,181.93
Advance Payments on 1952-1953 Budget		3,010.00
		$544,911.70

LIABILITIES

Advance Receipt on Corporation Dues 1952-1953		100.00
Principal of Endowment Funds		369,613.06
Principal of J. B. Nies Building Fund		52,666.63
Reserve Funds		
J. B. Nies (For Research School)	31,520.77	
Reserve for Research	18,110.20	
Felix M. Warburg Fund	12,203.75	61,834.72
General Corporate Account		60,697.29
		$544,911.70

"We have examined the Financial Statement and statements of General Income and General Expense of the American Schools of Oriental Research as of June 30, 1952 and for the year then ended. At New Haven and Jerusalem, independent auditors verified the balance of cash on hand and the statement of operations for the year which was accepted by us without further verification. Subject to the limitation of their work, in our opinion, the noted financial statements properly reflect the financial condition of the American Schools of Oriental Research at June 30, 1952 and the results of the transactions for the year then ended.

WHEELER, CROSBIE & COMPANY
Certified Public Accountants
121 South Broad Street
Philadelphia 7, Pennsylvania

CURRENT AND FORTHCOMING PUBLICATIONS AND SLIDE LECTURES OF THE SCHOOLS

Since our latest statement (BULLETIN, No. 127, p. 4) on the progress of our publications, Professor Solomon A. Birnbaum's monograph on *The Qumrân (Dead Sea) Scrolls and Palaeography* has appeared as *Supplementary Studies*, Nos. 13/14 (issued in November). Written by the foremost living authority on Hebrew palaeography and lavishly illustrated, this study not only replies effectively to his critics but also provides the student with a valuable introduction to the subject. In spite of the rapid acceleration of manuscript finds in the Dead Sea region since January, 1952, there are still savants who disregard the palaeographical evidence

and seem to think that archaeology stands still while they celebrate cheap "triumphs." The cost of this study is $1.50 postpaid for non-members.

Next in this series comes Professor Ovid R. Sellers' *A Roman-Byzantine Burial Cave in Northern Palestine*, which should be out in the early winter at latest, since it is now in press. This will be a lavishly illustrated monograph on his excavations at Silet edh-Dhahr.

Note again that President Nelson Glueck's *Explorations in Eastern Palestine*, III (*Annual* XVIII/XIX) has been reprinted; and that since our previous announcement his *Explorations* I (*Annual* XIV) has gone out of print, but will be reprinted this winter.

Our other publications continue to appear regularly. Note particularly that the important monograph by H. G. Güterbock, *The Song of Ullikummi* (60 quarto pages reprinted from the *Journal of Cuneiform Studies*, 1951-1952) is now available in separate form at the moderate price of $2.00; it is an extremely important publication of a Hittite recension of a Horite (Hurrian) mythological epic by one of the two or three leading Hittite scholars in the world.

Recent issues of the *Biblical Archaeologist* include matter of first-class importance for scholars as well as for laymen. The February (1952) number contains the first scholarly account of the first two campaigns of excavation carried out by the American Foundation for the Study of Man in South Arabia, written by Gus Van Beek, a member of the staff of the second campaign in Qatabân. The May number contains Dr. Lucetta Mowry's account of "The Jordan Valley during the Roman Period," and the September number features Dr. Emil G. Kraeling's first detailed account of the valuable Elephantine papyri in the Brooklyn Museum, which he is publishing. The December number contains the first scholarly account to appear in this country of the extraordinary discovery of Gnostic codices at Choenoboscium in Upper Egypt, written by Dr. Victor R. Gold.

We have to thank the University of Chicago and the American Foundation for the Study of Man for paying half the cost of printing the important papers by Professors H. E. Wright, Jr., and Frank P. Albright, which appear in this number of the BULLETIN. We are, therefore, able to give our subscribers a much larger issue than usual, at a lower cost to the Schools than usual.

Attention of all British subscribers and purchasers of our publications is called to the fact that our British agents are Messrs. Blackwell ("Blackwell's"), Broad Street, Oxford, England, whom we heartily recommend also to our American friends who are looking for a good British bookseller.

Among new slide lectures now obtainable in the 2 inch by 2 inch form which we are introducing (see BULLETIN, No. 126, p. 34) is a set of colored slides and notes on Petra by Professor William H. Morton, who is also preparing a similar set on Jerash. All correspondence should be addressed to the New Haven office.

THE GEOLOGICAL SETTING OF FOUR PREHISTORIC SITES IN NORTHEASTERN IRAQ

H. E. WRIGHT, JR.
University of Minnesota

ABSTRACT

The foothills belt of northeastern Iraq, between the Mesopotamian lowland and the Zagros Mountains, is marked by linear ridges alternating with broad valleys or plains. In one of these intermontane valleys, the Chemchemal Plain, are located three open sites excavated by the Oriental Institute and the American Schools of Oriental Research. Detailed studies were made of the intimate relation of these sites to the landforms and physiographic history of the Chemchemal Plain.

The landforms of the Chemchemal Plain record cycles of stream erosion and deposition to be tentatively correlated with the climatic fluctuations that in higher latitudes produced glaciation. On the basis of these correlations, the site Barda Balka (Acheulean-type and Mousterian-type) was occupied at the very beginning of the last (Würm) of the four glacial stages of Pleistocene, and is of much greater antiquity than the other two sites. The physiographic relations show that Karim Shahir ("Mesolithic") and Jarmo ("Neolithic") were inhabited during a post-glacial relatively dry period. This in turn was followed by a relatively moist period dated as First Millennium B. C. and finally by the modern relatively dry period.

The fourth site excavated by the group, Palegawra (latest Paleolithic), is a shallow limestone cave in one of the ridges beyond the Chemchemal Plain, and cannot be related to the physiographic history of the Plain.

Introduction

The Baghdad School of the American Schools of Oriental Research joined with the Oriental Institute of the University of Chicago in 1950-1951 in the excavation of four sites in the foothills of the Kurdish mountains of northeastern Iraq (1, 2). The writer, on leave from the University of Minnesota and supported by a grant from the Wenner-Gren Foundation for Anthropological Research, joined the group for three months to study the geological setting of the sites and to conduct geological-archaeological reconnaissance in the surrounding country. He is indebted to the four organizations mentioned above, and to Robert and Linda Braidwood, Bruce Howe, and other members of the field staff for spirited aid in the geological work. Dr. Naji al-Asil, Director-General of the Iraq Department of Antiquities, and his representative Sayyid Sabri Shukri were particularly helpful in facilitating travel throughout the country, without which it would have been extremely difficult to gain the proper perspective or to study certain critical areas in detail. H. L. Movius, Jr., R. J. Braidwood, and C. E. Stearns have kindly reviewed the manuscript of the present preliminary report.

Regional Geology

In northeastern Iraq between the Mesopotamian plain and the high Zagros Mountains of the Iraq-Iran frontier is a series of northwest-trending anticlinal ridges of ever-increasing topographic and structural relief (Fig. 1, insert). The outer ridges rise only a few hundred feet above the city of Kirkuk, which is located at the edge of the foothills belt at an elevation of about 1100 feet above sea level. They represent minor upfolds in young sedimentary rocks which were themselves derived from the erosion of the earlier-formed structures of the Zagros Mountains. Toward the mountains the successive ridges rise 3000-5000 feet above the basins, the latter of which have elevations 2000-3500 feet above sea level. These anticlinal ridges are made largely of resistant limestone, and the basins are etched out of the younger shales, sandstones, and

gravels. The structure and topography culminate in the crest of the Zagros Mountains at elevations of 8000-11500 feet above sea level.

The country is drained by four great transverse rivers which rise

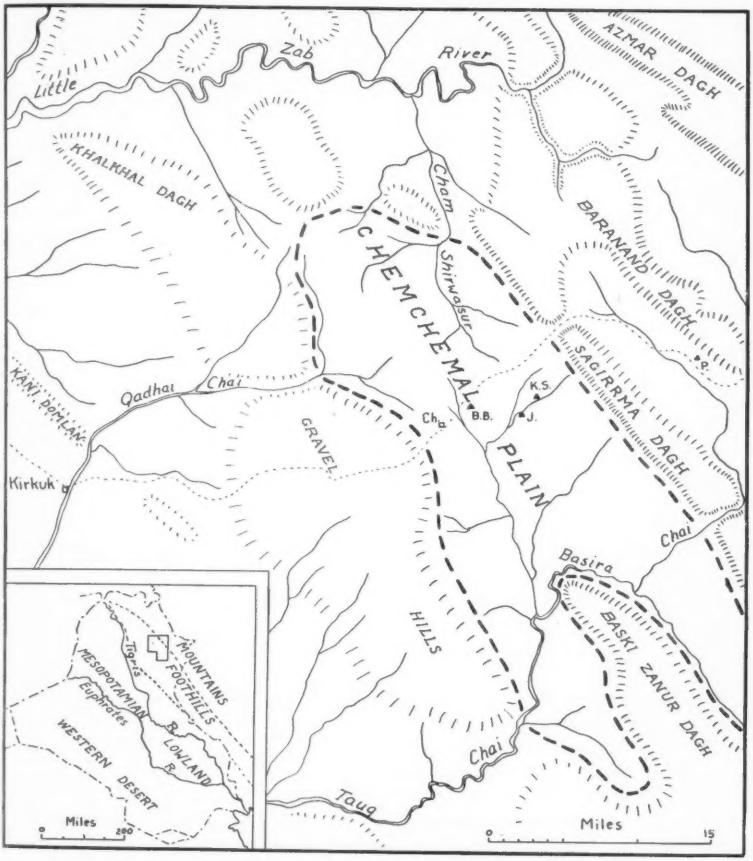

FIG. 1. Map of Chemchemal Plain and environs, showing location of archaeological sites discussed (*P.* for Palegawra, *K.S.* for Karim Shahir, *J.* for Jarmo, *B.B.* for Barda Balka). *Ch.* is for the village of Chemchemal. Index map of Iraq in insert shows principal physiographic regions.

in the Zagros Mountains or the Iranian Plateau and flow southwestward to the Tigris River—the Khabur, Great Zab, Little Zab, and Shirwan (Diyala). These master streams have cut sharp canyons across the

limestone ridges, and exhibit numerous right-angle bends where segments of their courses turn to follow the lengths of the basins. The master streams and their tributaries which drain the basins all exhibit terraces and associated pediment-like erosion surfaces which record several distinct cycles in the general erosion of the foothills area. The cyclic behavior of the streams is ascribed in part to continued uplift of the Zagros Mountains, and in part to climatic fluctuations which affect the ability of a stream to deepen or broaden its channel.

During three months of reconnaissance, segments of all four of these major streams were visited and the Tigris River itself was observed at several points. Of the many intermountain basins, greatest attention was directed to the Chemchemal Plain, which lies inward from the minor ridges of the Kirkuk area and outwards from the first major limestone ridge (Fig. 1). On this plain were located three of the four sites excavated by the Oriental Institute and the American Schools of Oriental Research: Jarmo, Karim Shahir, and Barda Balka—the latter having been worked on behalf of the Directorate General of Antiquities, through direct arrangements made by Dr. Naji al-Asil. The fourth site, Palegawra, was located on the limestone ridge bordering the next basin inward towards the mountains.

Physiographic Features of the Chemchemal Plain

The Chemchemal Plain is about 40 miles long in a northwest-southeast direction, and about 12 miles broad (Fig. 2). It is drained longitudinally by three streams, all of which head near the center of the Plain close to the large village of Chemchemal. The southeastern half of the plain is drained by the Basira-Tauq Chai, which cuts through the gravel hills bounding the Plain on the southwest and emerges on the Mesopotamian desert plain, eventually to find its way to the Tigris River. The western quarter of the Chemchemal Plain is drained by the Qadhai Chai, which also cuts the gravel hills, flows past Kirkuk and thence southward to the Tauq Chai. The northern quarter of the Plain is drained by the Cham Shirwasur, which crosses the northwest end of the limestone ridge bounding the Plain on the inside, and then flows northwestward to the Little Zab River.

Each of these three drainage sectors of the Chemchemal Plain is marked by two major erosion surfaces, now deeply dissected by a gully system 100-200 feet deep (Fig. 2). The upper of the two surfaces, named the Chemchemal surface, is preserved along the flanks of the basin and in the transverse divide area of the basin near the village of Chemchemal. The erosion surface itself, cut on gently folded Miocene and Pliocene redbeds and conglomerates, is buried by gravel and silt. The drainage pattern of the entire Chemchemal Plain at the time of formation of the Chemchemal surface was not the same as it is today, for one major stream entered the Plain through a sharp gap (Darbend) in the limestone ridge which borders the Plain on the northeast. This stream course was abandoned in later erosional stages and now persists as a very striking " wind gap " which has provided for early people a most acces-

sible route of exit from the high mountains to the Chemchemal Plain and thence to the Mesopotamian Plain.

The lower of the two surfaces on the Chemchemal Plain is called the Jarmo surface. It is developed independently on each of the three drainage systems which originate on the Plain. It takes the form of broad areas of flat or gently sloping land along the principal drainage-ways, and lies some 50-100 feet below the remnants of the Chemchemal surface. It is now sharply dissected by the modern gully system 100-200 feet deep.

Like the Chemchemal surface, the Jarmo surface is marked by a cover of silt, with gravel at the base. The average thickness of the silt cover on the Jarmo surface is 30-75 feet, but in the western sector of the Plain, drained westward and southward by the Qadhai Chai, the thick-

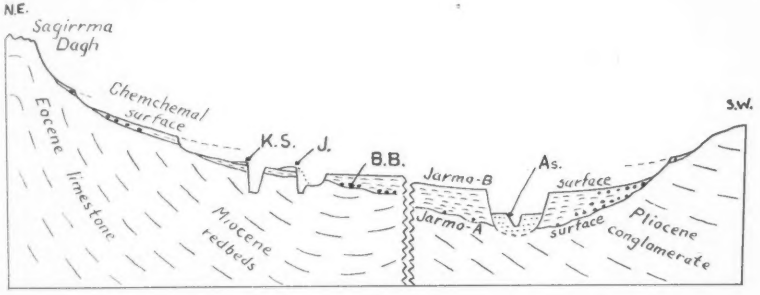

FIG. 2. Diagrammatic cross-section of Chemchemal Plain, showing relation of archaeological sites to physiographic surfaces. *B.B.* is for Barda Balka, *K.S.* for Karim Shahir, and *J.* for Jarmo. *As.* refers to location of Assyrian potsherds found in fill terrace.

ness of the cover reaches 200 feet and locally includes lake sediments midst the dominantly river-laid deposits (Fig. 3).

In addition to those two broadly developed erosion surfaces on the Chemchemal Plain, there are younger stream-formed surfaces found within the limits of the gully system cut into the Jarmo surface. In the drainage of the Tauq Chai these take the form of *erosional terraces* at several levels in the 100-150 foot deep gullies, formed during minor pauses in the general down-cutting of the gullies. In the drainage of the Qadhai Chai, on the other hand, a more significant stream history is recorded. Here the Jarmo surface, with its exceptionally thick cover of river and lake deposits, was dissected to a depth of at least 200 feet, and then partially filled back to form a *fill terrace*, now standing about 30 feet above the gully bottom which was produced by still later dissection (Fig. 3).

Physiographic Positions of Archaeological Sites

The three archaeological sites excavated in the Chemchemal Plain, namely Jarmo, Karim Shahir, and Barda Balka, are all close to the

center of the Plain and can all be related specifically to the physiographic surfaces described above. The fourth site excavated by the group, Palegawra, is a limestone cave site located in the next valley to the northeast, and is not susceptible to physiographic interpretation. Typologically Palegawra is latest Paleolithic.

Barda Balka yields a mixed archaeological assemblage of hand-axes, pebble tools, and flakes which resemble elements in the Acheulian and Mousterian industries (3). The artifacts were found *in situ* in the basal gravel beneath the thick silt cover of the Jarmo surface (Fig. 4). The site may thus be safely dated geologically as contemporaneous with the very beginning of the cycle of deposition which produced the silt cover on the Jarmo surface, and of course much older than the cycle of erosion which has produced the modern gully system.

Jarmo and Karim Shahir are both low mounds located on top of the silt cover of the Jarmo surface, on the rim of one of the tributary gullies in the Tauq Chai drainage system (Fig. 4). Typologically Karim Shahir is the more primitive, and would be classified by many as "Mesolithic," being marked by polished stone celts as well as microlithic flint tools. Jarmo, the principal excavation of the archaeological group, might be classified as "Neolithic," for it is marked by a simple village architecture, agricultural tools such as sickle blades, crude pottery in the upper levels, predominance of bones of presumably domesticated animals, and abundance of impressions of grains of wheat and barley (4, 5, 1, 2).

Jarmo was probably inhabited when the gully beside it was about 120 feet deep, at a level now marked by a small terrace standing about 30 feet above the present gully bottom (Fig. 5). Evidence for this statement comes from the degree of weathering and incipient soil formation—specifically the thickness and concentration of a zone of calcium carbonate nodules just below the surface. Calcium carbonate is leached out of the surface layers by percolating rainwater and reprecipitated at a depth of a foot or two, where it cements particles of silt together to form crudely spherical nodules ¼ to 1 inch in diameter. The thickness and degree of development of the nodule zone is a crude measure of the lapse of time since exposure of the surface, assuming other controlling factors to be equal. Now the nodule zone which has developed on the surface of the mound itself since habitation is about 1-2 feet thick, and the nodule zone on the thin silt cover of the 30-foot terrace is also about one foot thick. These two surfaces have therefore been exposed about the same length of time. Beneath the 20 feet of cultural debris which make up Jarmo mound there is another nodule zone, developed on the underlying silts of the Jarmo surface. This buried nodule zone has a thickness of 6-8 feet, probably a minimum figure because the nodules extend to the base of the silts. Apparently, therefore, a longer time elapsed between the deposition of the silt cover on the Jarmo surface and the beginning of habitation of Jarmo mound than has elapsed since the abandonment of the village site. During this pre-village interval the gully commenced its formation, and had reached about four-fifths its present depth at the time Jarmo village was abandoned. In the relatively short period

subsequent to the Jarmo habitation the gully renewed its dissection, and the weathering of the cultural deposits and of the terrace deposits produced a thinner horizon of carbonate nodules.

Karim Shahir (Fig. 4) occupies a position comparable to Jarmo on the rim of the same gully. Here the cultural deposits are only a very few feet thick, and the zone of post-habitation nodules extends downward to become continuous with the zone of pre-habitation nodules, the total thickness being about 25 feet. It is probable that Karim Shahir, like Jarmo, was inhabited after the gully had reached a moderate depth.

FIG. 3. Jarmo surface (flat horizon) in the Qadhai Chai drainage, dissected by deep gullies which were partially refilled and then recut to form the 30-foot fill terrace on which the village of Sedan is located. Assyrian potsherds found *in situ* in the terrace fill near this village.

CONTROLLING FACTORS IN THE EROSIONAL HISTORY OF THE CHEMCHEMAL PLAIN

The Chemchemal and Jarmo surfaces are considered to be buried pediments, formed first by erosion by streams to smoothly graded surfaces, and then buried by stream deposits. The formation of a graded erosion surface (pediment) is the result of a certain equilibrium among the stream discharge, the sediment characteristics of the streams, and the stability of the base level of erosion. The deep burial of this erosion surface is the product of another set of equilibrium conditions. To emphasize these distinctions for the present discussion, the erosion surface may be called the Chemchemal-A and Jarmo-A surfaces, and the depositional surfaces Chemchemal-B and Jarmo-B.

One possible cause for an upset in the balanced condition of a graded

stream is climatic change. Climate controls directly the volume of water in the streams, but it also, by its effect on the vegetative cover of the hill slopes, controls the extent of soil erosion and thereby the proportion of sediment load to water volume in the stream. The effects are complex, and on the basis of climatological and physiographical reasoning one can either correlate downcutting with a relatively humid climate and deposition with a relatively arid climate, or can make the reverse correlation. Huntington (6), for example, who was the first to emphasize broadly the climatic control on stream behavior, maintained that in a relatively arid climate run-off would be insufficient to transport the sediment supplied from the hill slopes, so deposition would occur. Bryan (7), on the other hand, felt that in a relatively arid climate the reduction of plant cover on hill slopes and floodplains would actually increase the runoff during occasional heavy storms, subjecting these areas to soil erosion and extensive gullying, with deposition occurring only far downstream on the major rivers. To support his reasoning, Bryan demonstrated in the southwestern United States that periods of pre-historic gullying were associated with sand-dune deposition, caliche formation, and other processes associated with more arid climates, and that alluvial fills were marked by elephant fossils, lake beds, and other evidences of relatively moist climate for this area.

If we extend Bryan's view to the foothills belt of northeastern Iraq, an area with a semi-arid climate comparable to that of the southwestern United States, then the episodes of erosional formation of the Chemchemal-A and Jarmo-A surfaces may be correlated with relatively arid climatic phases, and the episodes of burial of these erosion surfaces may be correlated with the relatively humid phases. Evidence in this area for this general correspondence is the presence of lake beds in the Jarmo silts at a few localities on the Qadhai Chai sector of the Chemchemal Plain, and the presence of swamp- or lake-beds in the Jarmo silts beneath the mound of Karim Shahir.

A second probable controlling factor in the erosional history of the Chemchemal Plain is continued uplift in the Zagros Mountains. The latter form a segment of the relatively youthful double mountain belt which extends across southern Europe and Asia from the Atlas and the Pyrenees on the west to the Himalayas and Indonesia on the east. The first uplift of the Zagros Mountains was recorded in late Cretaceous, and movement gradually accelerated until a climax was reached in the Pliocene, as recorded by the coarse Pliocene gravels deposited by streams in subsiding basins in front of the rising mountains (8). The fact that the gravels themselves are deformed in the foothills belt indicates that structural disturbances continued beyond the Pliocene and may have been a factor in controlling the activity of the Pleistocene streams which have etched out the Chemchemal Plain.

It is felt that the crustal movement in the later Pleistocene in the foothills belt has not been a continued growth of folds, but has all been in the nature of intermittent uplift of the entire mountain mass with no appreciable accompanying subsidence of the Mesopotamian lowland.

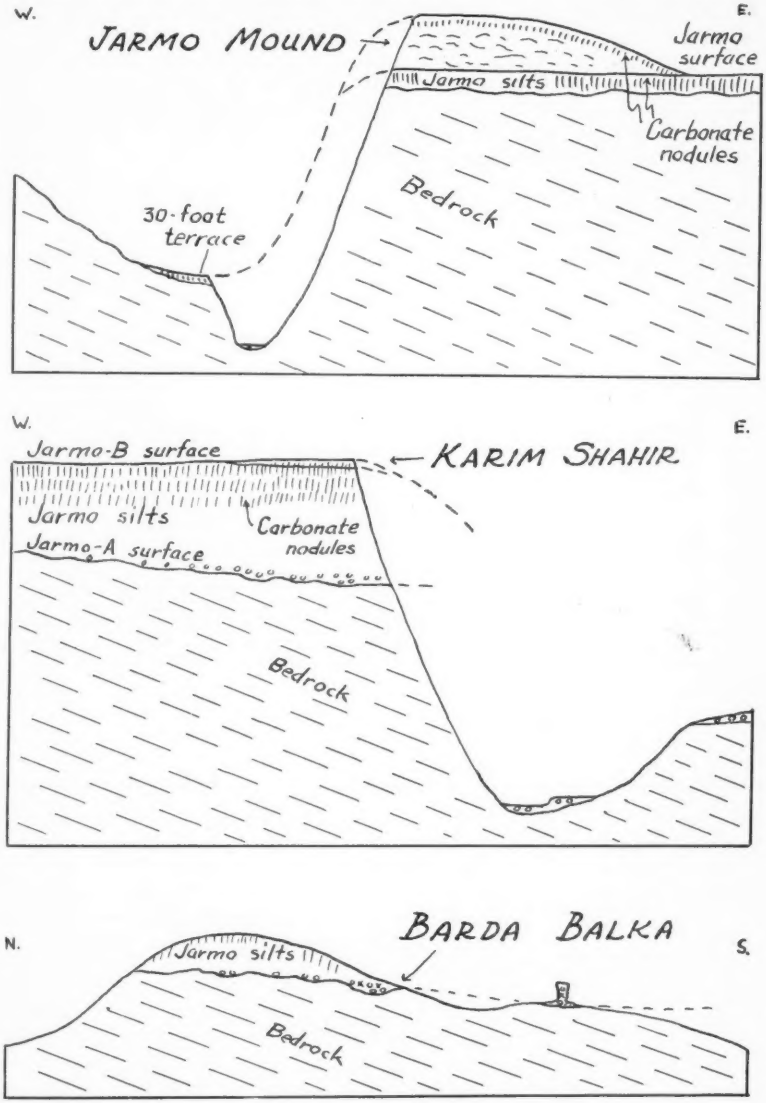

FIG. 4. Diagrammatic cross-sections of the three archaeological sites and associated geologic features on the Chemchemal Plain.

The intermittent uplift could initiate prolonged cycles of stream erosion which would result in the formation of the extensive erosion surfaces. The burial of the erosion surfaces seems to have been controlled by climatic change rather than by local crustal subsidence because the pattern of deposition is related closely to the form, drainage, and sediment characteristics of the entire Chemchemal Plain rather than to the several local structural axes within the Plain.

FIG. 5. Jarmo mound viewed from opposite side of gully. Note tilted bedrock, thin cover of Jarmo silts, the mound excavation, and, sloping away from the foreground, the 30-foot cut terrace.

INTERPRETATION OF THE EROSIONAL HISTORY OF THE CHEMCHEMAL PLAIN

The physiographic surfaces on the Chemchemal Plain are tentatively correlated with climatic changes and crustal disturbances in the following manner. The area of gently folded redbeds in front of the outside limestone ridge was eroded to a smoothly graded surface called the Chemchemal-A surface, with a coating of chert and limestone gravels derived from the adjacent limestone and conglomerate ridges. This surface represented an interval of crustal and climatic stability of sufficient duration to permit the entire stream system within the Plain to lower the small interstream divides nearly to a common level.

The Chemchemal-A surface actually does not represent the first Pleistocene cycle of erosion in the Plain—older periods are recorded by still higher erosion surfaces not completely removed during the Chemchemal cycle.

A change in climate towards the humid side is postulated to account for the deposition of the silt cover to make the Chemchemal-B surface.

Following the Chemchemal cycle of erosion and deposition, renewed downcutting occurred, and eventually produced the Jarmo-A surface, principally along the three main streams of the Chemchemal plain and thence transversely up major tributaries, leaving long fingers of Chemchemal surface extending as residuals from the bordering ridges out into the basin. This rejuvenation of the streams was probably brought about by renewed uplift in the mountain belt. During the cycle of planation the climate became more arid.

A return to a more humid climate initiated deposition on the Jarmo-A (erosion) surface to make the Jarmo-B (depositional) surface. Barda Balka was occupied at the very beginning of the episode of deposition. The Barda Balka gravels were buried and the thick cover of Jarmo silts was deposited on all three drainage systems in the Chemchemal Plain. The thickest deposits were put down in the Qadhai Chai drainage, amounting to a maximum thickness of 200 feet along the axis of the valley. Locally the deposits include lake beds.

The next event was dissection of the Jarmo surface, brought about by the recurrence of an arid climate and perhaps renewed uplift in the Zagros Mountains. The gully system in time extended to all parts of the Jarmo surface and penetrated the deformed redbeds beneath the cover of silts. The site of Jarmo (tentatively dated by radio-carbon as about 4750 B. C.) was inhabited when the gully at its side was about 120 feet deep, or four-fifths its present depth. Karim Shahir, a mile upstream, had been inhabited shortly before.

A return once again to a relatively humid climate is recorded in the Qadhai Chai segment of the Chemchemal Plain. Here the gullies had been incised rapidly through the exceptionally thick cover of weak Jarmo silts, and perhaps had attained such an equilibrium that the change in climate could upset the equilibrium and cause the stream to deposit. The gully was thus partially filled to a height of about 30 feet. Pottery found in this fill has been tentatively identified as late Assyrian (750-600 B. C.).

A final climatic change to relative aridity interrupted the cycle of deposition on the Qadhai Chai, and the 30-foot fill has since been dissected and left as a terrace. During this last epicycle of filling and cutting in the Qadhai Chai drainage, the other two drainage systems of the Chemchemal Plain had continued the general dissection through the thinner silt cover and into the relatively resistant bedrock. The narrow erosional terraces visible at several levels in the deep gullies record only temporary attainment of equilibrium in the stream conditions, and were probably brought about by purely local controls on the stream rather than by any basic climatic change. These streams in general had not advanced sufficiently far in the erosion cycle to be sensitive to climatic change.

It should be emphasized that the climatic changes postulated above, as based on the physiographic record, are all relative changes, and no attempt is made to assign values or even relative importance to the changes in rainfall or temperature or any of the other climatic elements

which are important in controlling physiographic processes. The climatic changes can only be viewed in the light of their relative effects on these processes, and with reference to the known present climatic regime.

The present climate in the foothills belts is marked by winter rains and intense summer drought. Annual rainfall at Kirkuk, which has an elevation of 1100 feet above sea level, is about 12 inches (9). Rainfall increases towards the mountains, and at Suleimaniya, situated at the base of Azmar Dagh at an elevation of 2800 feet (Fig. 1), the rainfall is as great as 25 inches because of proximity to high ridges. The Chemchemal Plain is situated well in front of the higher ridges at an elevation of about 2200 feet, and the rainfall here is probably about 16 inches. Vegetation is largely grass, and most of the level areas are cultivated for barley and wheat or are grazed. Sagirrma Dagh and the other limestone ridges are marked by scrubby oak trees which would probably grow to larger size were it not for the activities of wood-cutters and goats. The presence of large trees in certain protected areas (e. g., cemeteries) near villages on the Plain indicates that the present climate of the area could support a much higher percentage of trees than now is permitted to exist.

Dating of the Landforms and Archaeological Sites

It is generally considered that the climatic changes which produced glaciation in temperate latitudes produced pluvial (i. e., rainy) conditions in the lower latitudes, because of the equatorward displacement of the storm tracks associated with the belt of prevailing westerly winds (10). Typical evidence in the Mediterranean area for the correspondence of pluvial and glacial climates is the situation along the coast of Lebanon, where the writer found that accelerated stream deposition, believed to be a result of increased weathering and erosion in the mountains in a pluvial climate, was associated with a time of low sea level (glacial stage) (11).

In the Chemchemal Plain the physiographic relations described above suggest the occurrence of three pluvial phases all more humid than the present (Table 1). The last, which was minor in extent, occurred during

Stream Activity	*Culture and Sample Date*	*Climate*	*Correlation*
Erosion	Modern	Dry	
Minor deposition	Assyrian 600-750 B. C.	Minor pluvial	"Sub-Atlantic"
Erosion	Jarmo ("Neolithic") 4750 B. C. Karim Shahir ("Mesolithic")	Dry	"Post-glacial climatic optimum"
Deposition of Jarmo silts	Barda Balka (Acheulean-, Mousterian-type) at very base	Pluvial	Würm
Erosion		Interpluvial	Riss/Würm
Deposition of Chemchemal silts		Pluvial	Riss
Erosion		Interpluvial	Mindel/Riss

Table 1. Correlation of landforms and archaeological sites in the Kurdish foothills with European Pleistocene chronology.

the First Millennium B. C., and the other two a relatively long time prior to 4750 B. C. Correlations may be attempted with the established climatic fluctuations of glacial and post-glacial time in Europe. It would seem that this last or minor pluvial might correspond to the relatively cold phase (" Sub-Atlantic ") following the post-glacial warm phase (" climatic optimum ") recorded by fossil pollen in northern Europe. The historical record in the Mediterranean suggests, at least to certain authors (10, 12), that shortly before the beginning of the Christian era there occurred a climatic phase that was relatively humid compared to the preceeding and the modern phases.

Preceding this minor pluvial occurred the period marked by the formation of the major gully system and the occupation of the " Mesolithic " and " Neolithic " sites. The climate at this time may be interpreted on the physiographic evidence as relatively dry compared to that of the preceding and following phases and perhaps about the same as the modern climate of the area. This dry phase might be the equivalent of the warm phase known from northern Europe as the post-glacial climatic optimum, which is dated there as 5500-1000 B. C. If this correlation is correct, it would suggest that the dry phase in the Kurdish foothills, which was well advanced when Jarmo was inhabited about 4750 B. C., commenced before its counterpart in the north, where the lingering effects of late-glacial sea-ice may have retarded the progress of local climatic change.

The next oldest pluvial phase, marked by the deposition of the Jarmo silts, was considerably older than the " Neolithic " and " Mesolithic " stages of Jarmo and Karim Shahir, for these sites were not inhabited until well after the silts had been deposited and even partially dissected. The great extent and thickness of the deposits suggests that this episode of deposition lasted a very long time compared to the later minor pluvial phase of the Assyrian period. This pluvial stage would correspond perhaps to the entire Last Glacial Age of Europe (Würm in the Alpine chronology). At the base of the deposits occur the Acheulean-type and Mousterian-type artifacts of Barda Balka, which may thus be correlated with the very beginning of the Last Glacial. Various estimates place the beginning of the Last Glacial at 60,000 to 120,000 years ago.

Older pluvial and interpluvial phases can be correlated at the present time only by counting backward from the Last Glacial, and the matter becomes complicated by the probably greater importance of mountain uplifts in the control of stream behavior. If the deposition of the Jarmo silts is correctly correlated with the Würm pluvial, then the formation of the erosion surface beneath the Jarmo silts would correspond to the Riss/Würm interpluvial, and the erosion and burial of the Chemchemal surface would correspond respectively to the Mindel/Riss interpluvial and the Riss pluvial.

Conclusions

It should be understood that the above correlations presented in this preliminary paper are tentative. They are based largely on reconnais-

sance field work and an incomplete analysis of the geological materials mapped and collected. Further, the climatic sequence postulated above is inferred from the geological relations only, and is derived independently of possible faunal and floral evidence which will result from studies now being made of the animal and plant material collected at the sites. A discussion of the significance of the correlations with respect to other geologically or climatically dated sites in the Middle East, such as Mt. Carmel in Palestine (13) or Ksar 'Aqil in Lebanon (11), will be postponed until such time as the typology of the artifacts has been fully explored and the geological, botanical, and zoological collections fully analyzed.

Further geological and archaeological work in the Kurdish foothills may confirm or disprove the correlations here tentatively presented. Although the geological reconnaissance revealed a regretable dearth of good climatic indicators in the area, such as well-developed buried or relic soils, fossil pollen, glacial outwash in mountain streams, sand dunes, and river terraces traceable to marine terraces, the writer feels that a fairly detailed geological-archaeological chronology can be established in this area, and that the all-important relation of the mountain streams to the historical development of the Mesopotamian Plain is susceptible of solution.

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THE EXCAVATION OF THE TEMPLE OF THE MOON AT MÂRIB (YEMEN)

FRANK P. ALBRIGHT

In April, 1951, the American Foundation for the Study of Man, headed by Wendell Phillips, obtained a year's contract from the Imam Ahmed, king of Yemen, permitting the Foundation to excavate anywhere within a 25 kilometer radius of the ancient city of Mârib, once capital of the land of Sheba. The Imam was to erect housing and working quarters, while the Foundation was to have all rights to publication. Local preparations were very slow, but the expedition had been carrying on preliminary work under the field direction of Robert Carmean and the supervision of our epigrapher, Dr. Albert Jamme. The expedition was just about to go into full operation when it was suddenly disrupted on February 12th, 1952.

I had been nearly two months at the site, and Dr. Jamme had been there a month and a half longer, copying inscriptions and directing small-scale excavations at the Temple of the Moon, some two miles southeast of Mârib. Two more young archaeologists, James Rubright and Ralf Andrews, and the architect, John Henry Scarff of Baltimore, arrived in time to take part in the last few days of the excavation. Mr. Scarff was able to take the measurements which made his plan of the temple possible. The situation then became so dangerous that Mr. Phillips decided to evacuate the personnel for the sake of their personal safety, even though this entailed probable loss of all equipment and personal property.

Actual working conditions were somewhat difficult, because any work of this nature was so foreign to the laborers that progress was necessarily slow. We were, therefore, able to train only a few men to work carefully enough for responsible tasks. We had two first-rate foremen, Reis Gilani and Reis Shatir, who were the best of the six Guftis we had employed the year before in Beiḥân (Reis Gilani had been Herbert Winlock's chief digger for many years). However, it was generally necessary to place them over more natives than they could easily manage. We employed up to 121 men and boys and 60 oxen at a time. While the work of neither men nor oxen was very efficient, all were for the most part willing. Our relation with the people of Mârib was always good. Our only troubles came from the authorities. And I wish to take this opportunity not only to compliment the two Egyptian Guftis but also the people of Mârib. The depth of sand that had to be removed also made progress slow, averaging from 5 to 7 meters. We used oxen with Arabian scrapers wherever possible and finished off with baskets carried by boys. We also used a Barber-Green conveyor belt on occasion until our gasoline supply became depleted.

Mârib was not only the one time capital of the Sabaean kingdom but

also the site of the dam, renowned as the greatest of ancient times. Here also was the famous Ḥaram Bilqîs, the largest of Himyarite temples.

This temple, named Awwâm and dedicated to the moon god, Ilumquh, as the large inscription of the temple itself tells us,[1] was the site of our work. Dr. Jamme had already removed the sand around the temple to a point where he could copy and make latex squeezes of the inscription when I came.

The temple is an ovoid, or rather a somewhat kidney-shaped (Fig. 1), structure with longest axis east-southeast and west-northwest and an entrance court on the north side somewhat east of center. It has a circumference of 300 meters with the diameter at the short axis 75 m. and at the long axis 112 m.[2]

The temple wall is constructed of a beautifully fitted ashlar masonry shell inside and outside with a sand and rubble fill. It is preserved in places to a height of about 9 meters above the entrance hall floor. There is no way of knowing how high it was originally or how the top is finished. It has three horizontal offsets of about 5 cm. each. The upper one is 20 courses of stone (about 5.80 m.) below the large inscription. The other two are each two courses lower. Seven courses below the lowest offset the horizontal joints are still level but the outside surface is left rough. We dug down nearly a meter more without finding the bottom of the foundation. The wall is 4.12 m. thick at the top offset, which was probably at the average ground level, and has a batter of 10 cm. in 2.60 m. height on both the outside and the inside surfaces. The ashlar stones average 29 cm. in height and vary greatly in length, most of them being about 1.25 m. to 1.50 m. long. Their outer surfaces are cut on a curve to match the curvature of the building. At distances apart of 3.05 to 3.30 m. are pairs of header blocks tying into the rubble so that their courses extend through the entire wall to tie the two faces together. These headers are always in pairs 1.15 to 1.30 m. wide (outside measurements). However, generally these ties are found only in the upper part of the wall. Lower down they are false, the center being filled with sand.

The outer wall surface is carefully "picked," and the joints smoothed with a flat chisel to a width of 8 cm. The inner surface is not so finished but is left slightly rough as if it were to be covered with plaster. Possibly it was not considered so important aesthetically.

The wall displays some variation in workmanship indicating that various contractors or technicians worked on it and that building was in process for some time.

Nothing is known of the inner structure of the temple for, though we started to remove the sand on rather a large scale, we had reached bottom at only one point when our work ceased. That point was directly in front of the main entrance.

What we found was a reconstruction apparently rather late in the

[1] Cf. Jamme, "Aperçu général des inscriptions copieés à Mareb (Yemen)," inscription number MaMB-12.

[2] These figures may be as much as 1.5 % off either way since more precise measurements could not be made before leaving.

'AWWÂM THE TEMPLE OF 'ILUMQUH
IN THE CITY OF MAREB, YEMEN

FIG. 1.

building's history, and it is quite possible that the temple was used as a fortress after it had ceased to be a temple, presumably after the beginning of the Moslem period.

The entrance hall is the only part of the temple entirely excavated. It consists of a peristyle hall with one large door leading into the temple and a large triple door leading out to an outer court and building complex which terminated in a row of eight large pillars (Fig. 2). The peristyle is 23.97 m. long and 19.15 m. wide, the long axis parallel to the temple. It fits into the open ends of the large oval wall. Presumably the peristyle, surrounding a hypaethral court, was roofed with a flat roof. The outer side of the roof was carried by a wall and the court side by 32 rectangular pillars. The triple door area was completed by two massive pylons. The portico area from wall to pillars is 2.22 to 2.30 m. wide except on the south side where it is 3.70 m. The wall is good ashlar masonry with finely picked surface. It has a base course 10 cm. thick and 26 to 29 cm. high. At a height of 1.52 m. average (5 courses of stone) the wall projects 10 cm. and from there on up has a batter of approximately 10 cm. in 2 m. elevation.

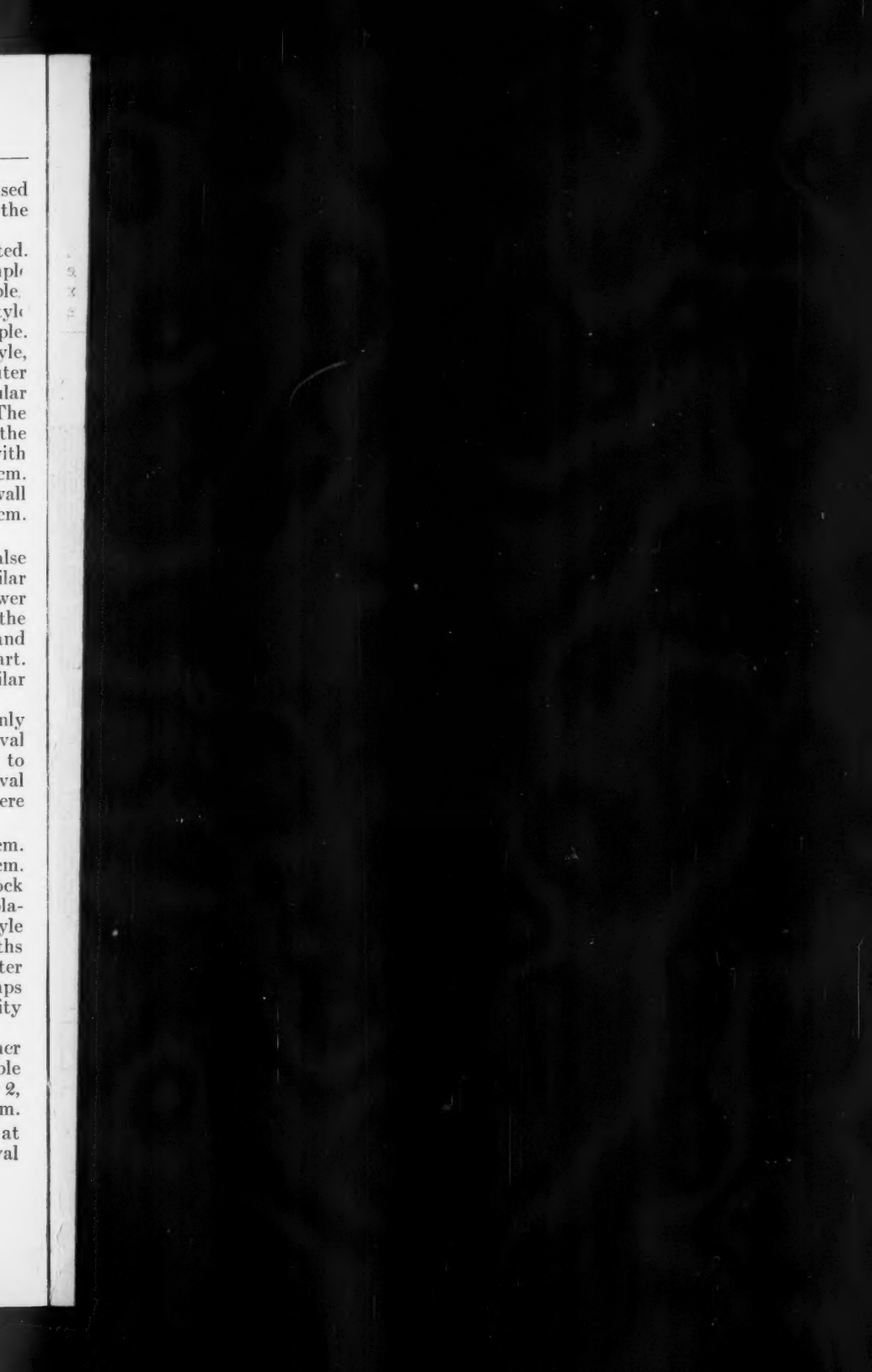
This section of the wall carries a very interesting series of 64 false "windows" in imitation of lattices. The outside of the walls has similar ornamental windows but they are located approximately 70 cm. lower on the wall without any regard to the spacing of the windows on the inside. The windows measure 42 to 46 cm. wide and 1.24 m. high and are set back into the wall 10 cm. They are spaced 45 to 70 cm. apart. Above each window is a "ventilator grill" design above dentils similar to those in the upper part of the window itself.

The north wall is 1.62 m. thick but the other walls seem to be only 74 to 80 cm. thick. They are not of solid stone, but, like the large oval wall, they have a core of rubble. No investigation has yet been made to see if the outer faces are tied together, but on the analogy of the oval wall, and because of the height of the walls, one may assume there were occasional stones extending from face to face.

The pillars on the east and west sides are 4.95 m. tall and 38 by 45 cm. in average cross section, while the others are 5.30 m. tall and 45 by 53 cm. in average cross section. On top of each pillar is a rectangular block approximately 10 to 12 cm. square and 8 cm. high to secure the entablature. The pillars stand on plinths, the tops of which are at the peristyle floor level, 20 cm. larger on every side than the pillars. All are monoliths except two. In these two cases a taller section is placed on a shorter one. They are kept in place by their weight only. No cement or clamps are used except in late repairs and reconstructions, where a poor quality of lime cement is sometimes used.

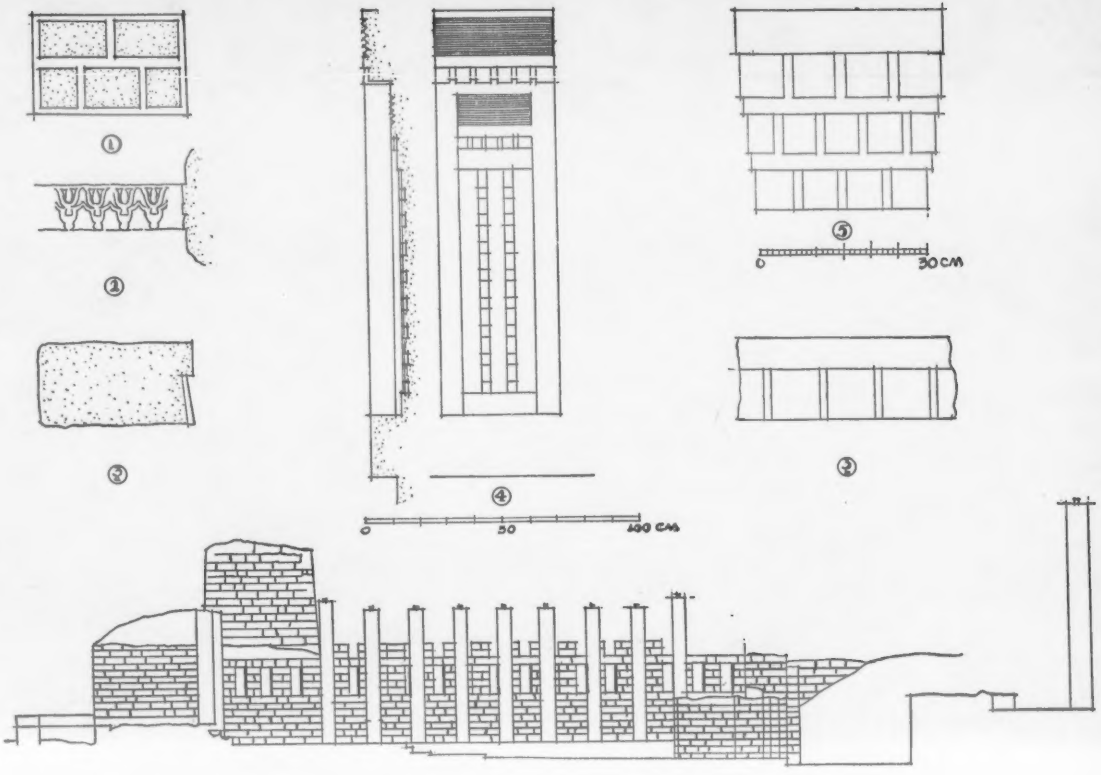
No capital was found to fit these pillars, nor was there any other stones which could be assigned to the superstructure, with the possible exception of a large number of stones with dentil mouldings (Fig. 2, 3a and b) about 30 cm. wide, some of them reaching a length of 2.30 m.

Oddly enough, sections of them were found throughout the sand at various depths; they were found built into the south side of the oval



'AWWĀM THE TEMPLE OF 'ILUMQUH IN THE CITY OF MAREB, YEMEN

John H Scarff del.



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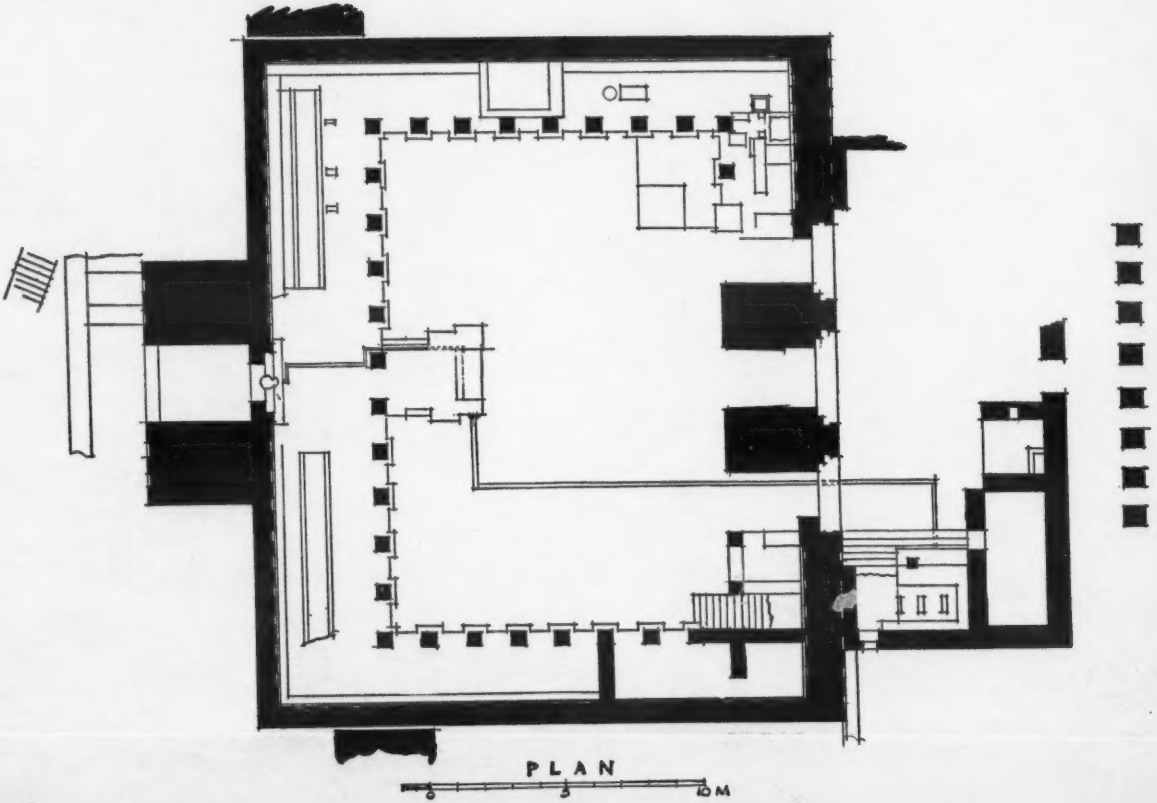

FIG. 2.

wall as cross ties; they were found as building stone in the walls of later Himyarite reconstructions and as bases for inscribed stones set up in the court.

Entrance was gained to the court and peristyle through a large triple door. The doors were separated by two large pylons, each 2.46 by 4.40 m., their length being the combined width of the peristyle and the wall. The outer ends of these pylons are stepped in so that the outside faces are only 1.16 m. A recess of approximately 3 cm. held a door frame, probably of wood. Bronze coverings were used in several doorways elsewhere in the temple but no sign of bronze was noticed here. The doors themselves, or even wooden door frames, may conceivably have been covered with bronze. The outer doors together with the frames were 2.78 m. wide and the center one 3.55 m. Their height cannot be determined even approximately since none of the wall remained standing above a height of about 3.50 m.

A single door led into the oval temple (Fig. 3). Here we are fortunate enough to have one door jamb preserved all the way to the top. It also is stepped back with an outer face 29 cm. wide and another 45 cm., set in 26 cm. The reveal is 40 cm. wide. The inner member is 3.97 m. high and the outer one 4.31 m. Each had carried a separate lintel stone held in place by a rectangular boss on the upper surfaces of the jamb.

The sill is composed of one block of crystalline granite-like stone 3.58 m. long, 77 cm. wide and 51 cm. high. A step 1.48 m., long, 25 cm. high and 26 cm. wide is cut into it, and another stone of similar material 2.70 m. long, 29 cm. high and 30 cm. wide is placed in front of it to make three steps up to the sill. This entrance was probably open at all times, for there is no sign of door suspension.

The steps had been covered with bronze and considerable green copper oxide was visible on it. The whole entrance between the massive pylons, 4.50 m. long, of which the jambs form the corners, may have had a bronze floor. The bottom stone of the walls, about 22 cm. high, are set back 2 cm. and this space was filled with lime cement faced with bronze, bits of which were still in place when excavated. The floor area itself, except for a stone rim about 20 cm. wide, was filled with sand. A trial dig over a meter deep failed to reach bottom.

Rather mysterious is a water course from these steps across the court, disappearing under a peculiar structure in the outer area. A large hole, 52 cm. wide, was eroded into the middle step also cutting deeply into the upper one and somewhat into the lower one. All evidence points to the water having come from overhead, falling onto the steps with force. The spread of the erosion indicates that a source the height of the lintel is quite probable. The bronze was evidently cut through by the water and remained in place while the water ate away the stone. The water then ran in a marble conduit at floor level across the peristyle, turning left and right, past the east side of the first pillar east of the doorway, in a covered conduit through the left side of a platform, emerging in a large bronze tray with an inscription on it,[3] measuring 69 cm. by 2.30 m.

[3] Cf. Fig. 4 and Jamme, *op. cit.*, inscription no. MaMB-313.

at the north end of this platform. Thence it ran eastward and again northward, passing through a bronze lining in the stone sill of the large

FIG. 3. South arcade of the peristyle looking west. Jamb of main entrance on left. Butt of oval temple wall behind end of arcade.

outer door, dropping to the outer pavement level, onward several meters, turning right and disappearing as mentioned above. The channel is

limestone except for the marble in the peristyle floor. It is about 15 cm. wide and 5 to 7 cm. deep. At the bottom of this the water had cut a meandering channel 3 to 7 cm. wide and about 5 or 6 cm. deep. This indicates either a steady or an intermittent stream of water over a very long period of time.

The floor of the peristyle is cement, but it is by no means a plain, unencumbered area. There is a bench about 35 cm. high and of about equal width along the east and west walls, constructed of a loose volcanic cinder block. This was a base for votive offerings, and several inscribed stones were found there *in situ*.

The south side was more complex. There was a similar bench-like structure against the wall to a height of probably 40 cm. and a width of 60 cm. Approximately 35 cm. in front of this was another platform in two stages, the bottom one 1.04 m. wide and 12 to 19 cm. high and the upper one 74 cm. wide, thus leaving a ledge of 15 cm. wide on each side. West of the main door (Fig. 3) the trough formed by the lower platform and the wall bench was paved with marble and contained a bronze inscription.[5] Fifteen centimeters north of the west end of this stepped structure, three stones 50 cm. high and 33 cm. wide were cemented into the floor, apparently the supports of a bench about 4 m. long.

The west and north sides of the peristyle as far as the door were occupied by some sort of a shop or factory (Fig. 5). There are several stone boxes ranging in size up to 2.24 by 2.98 m. and from 47 cm. to 1.00 m. in height. The outsides were of finished stone but the insides were left rough and filled with sand. There are several stones, round and rectangular, about half meter high with the tops slightly depressed and worn as if they had been used to grind on. There is a furnace 47 cm. high and 47 to 90 cm. large with a hole in one end and the top open. It was full of ashes and charcoal. From this furnace to the corner of the peristyle, a distance of 5 m., the floor was covered with ashes and charcoal. In this corner is also a stone tank, 44 by 48 cm. inside and 23 cm. deep, with a drain hole in one side.

These structures correspond in date with various phases of remodeling of the temple and show considerable remodeling and repair themselves. Many inscribed stones were used in some of this reconstruction.

We investigated the " sand boxes " carefully for signs of bronze casting, for there had been hundreds of statues, statuettes and plaques of bronze in the entrance hall and court, but we found no indication for or against this hypothesis.

In the northeast corner (Fig. 6) were three small rooms and a stairway which had been added later than the original building. The stairway ascends northward from the court, outside of the peristyle, by eleven steps to a landing and turns to the right. From there on it was destroyed. But two steps were found in the sand, nearly in place, and their exact positions were easily traced. Obviously the stairs made another turn to the right farther up and led to the peristyle roof. As indicated by the wear on the one stone *in situ* on the west side of the first landing

[5] Cf. Jamme, *op. cit.*, no. 147.

another branch of steps led to the left, either to a mezzanine room or to the top of the pylons.

The pillars, 68 by 75 cm. to 70 by 77 cm. cross section and 7.65 m. tall, stand approximately one meter higher than the pillars of the peristyle, nearly two meters higher than the floor of the area in front of the triple doors. A cement floor 2.12 m. wide connects with the 80 cm. thick wall to the south. This wall is of later construction than the original temple, as indicated by the finish of the stone, but since a few blocks of older stone were noted, it is possibly a rebuilt wall in the same location.

FIG. 4. View from center of court through temple entrance. Inscribed bronze trough in foreground. Note eroded steps in doorway.

The problem of the eight pillars is as enigmatic as that of the entrance. There stand the pillars. They obviously carried a superstructure, as indicated by the bosses on top to hold it. They probably, though not necessarily, had capitals. Capitals were found in the temple but they did not fit any of the shafts. One capital was found in the mausoleum adjoining the temple which fits the four interior shafts. A smaller temple, named *Bar'an*, about a mile from our temple, had six monolithic pillars with capitals on them. Since capitals are not the most desirable building stone for reuse and since these would have been large and unwieldy, at least one of the forty capitals should have been lying about.

But even without capitals a wall would have to be some eight meters high to meet the height of the pillars. The 80 cm. thick wall 2.12 m. south of the pillars could have reached that height as part of a two- or three-story building. The excavated walls abutting it on the south appear more like buttresses than like room walls. They are firmly bonded to the north wall but stand free at their southern ends. The south wall of the northeast room touches the west wall only at the corner without being in any way bonded to it.

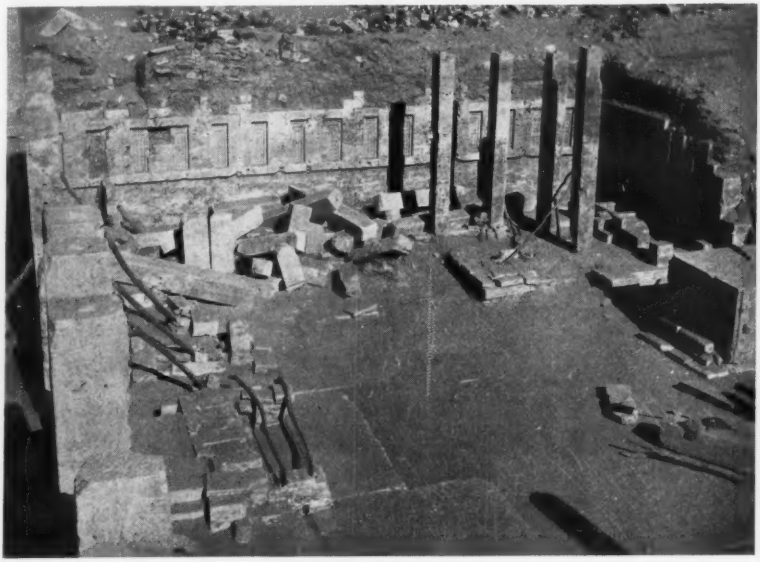

FIG. 5. Northeast corner of court.

There is a point in favor of free standing pillars. Not only are the eight pillars of this temple standing and the five (the sixth one is broken off) of the neighboring temple, but several in the ancient city of Mârib and a few others throughout the land. The foundations must be very solid, for they all stand fairly straight in spite of wind, rain, and sand storms. Furthermore, it is difficult to conceive of all temples as having been dismantled or as having collapsed and of all superstructures of the pillars as having been dislodged without one pillar having fallen.

Since this article is intended as a descriptive summary, the question is left open, but the posing of a few unanswered problems suggests the difficult circumstances under which our information was gained. It should also spur archaeologists to investigate this fruitful area of Mârib further.

Appropriately enough, at the very beginning of the preliminary investigation, even before the work properly had begun, a large inscription

around the outside of the oval wall was found by Dr. Jamme telling us the name of the temple, *'Awwâm*, and the god whom the temple served, *Ilumquh*. All down through the sand, stone inscriptions, or fragments of them, were found, but at the bottom the number of inscribed stones were almost overwhelming. The court was nearly surrounded by inscribed stones, often two or three stones high and often with a second row in front of the first. The court floor was paved largely with inscribed stones. They were found standing, lying, and fallen over on one another in the outer court. What the oval temple itself has to offer in inscriptions is not yet known except that in the very small area in which the sand was removed five inscriptions have already been found.

Two bronze inscriptions were found complete. The pillars are pocked with holes in which bronze plaques had been fastened. Many fragments were still there or lying about the court. The walls were less freely covered but they were not entirely bare. Inscribed stones usually had been surmounted by bronze (bronze, as far as our evidence goes) statues or statuettes, but frequently the statue carried the *ex voto* inscription and the base was plain.

Inscribing *ex voto* dedications on stone or bronze and setting them up in the temple may have reached the proportions of a commercial enterprise and was a large factor in Himyaritic religion. Not only were they made by the hundreds, and at considerable cost to the dedicator, but they were respected for a long time, as indicated by the large number of old inscriptions. The custom seems to have reached its greatest popularity after the second century B. C., from which period most inscriptions stem. Some time later respect relaxed and inscribed stones were used rather freely for building within the temple or for recutting other dedications. No one knows if any, or how many, were removed from the temple.

Dedicatory inscriptions were not the only votive offerings. The moon god, Ilumquh, went by other names as well, probably with special functions, and one of them was *Thôr*, the bull. Over a dozen more or less stylized bulls in marble or other stone and a few bull's heads in bronze were found in the temple and in the cemetery. The bull's head as well as the ram's head was used as a decorative device on friezes.

Many altar tops were found in the temple and tombs and in and about Mârib ranging in size from a few centimeters to several meters. There was considerable variation but the plan was always the same, a flat table with a rim and a drain channel on one side or on one end. The table was always thin, never with legs or stand. The rim varied from one millimeter for the small ones to about ten or fifteen centimeters for the largest. The end of the spout was usually decorated with a conventionalized bull's head. The small altar tables may have been only symbolic offerings but altars of a good range of size were used in ceremonies. The altars were used in connection with a liquid; their shape precludes burnt offerings.

Water seems to have been closely associated with Himyarite religion. It is the substance for which they most depended on the gods. It is

most important for sustenance of life as witnessed by the many dams and elaborate irrigation systems in the land and particularly by the great dam of Mârib. The water course described above was certainly in some way associated with rites of ablution. Perhaps a small stream of water falling down the center of the doorway symbolically purified everyone entering.

On the east side of the temple four small pillars, 37 by 46 cm., were projecting above the sand. The axis between the pillars aligned with

FIG. 6. Stairway and rooms in northeast corner of peristyle. Inscribed stones standing along the walls.

a splice in the oval wall over two meters away, where a door could possibly have existed. There was no door, but the building of which the pillars formed internal supports, turned out to be a mausoleum contemporary with the temple.

The mausoleum had an interior space of 6.25 by 4.33 m. The pillars are 3.60 m. high and the capitals 60 cm., making a height to the massive stone beams of 4.20 m. The tombs were arranged on shelves all around the room, measuring 63 cm. high and varying in length from 1.36 to 1.79 m. There were eleven of them if one counts the small 92 cm. space, which could have been a child's space. There were at least three tiers and probably four or even five tiers. Below the floor level we completely excavated one chamber 1.54 by 2.53 m. and 3.30 m. deep and over half

of a second one. The chambers had been much mulled over through the ages and supplied us only with broken objects consisting of bones, apparently of only one person, inscribed tomb covers, a little pottery, miniature altars, incense altars, marble bulls, etc., plus part of a sarcophagus, one alabaster face from a tomb stone and one tiny gold globe from jewelry. Much of this, such as the inscriptions, had fallen in from outside and was not part of the original tomb furnishings.

The area around the temple showed evidence of having been densely built up. It appeared also that there may have been some sort of a precinct wall on the south side. Therefore, while top sand was being removed by the oxen in one section of the outer court, most of the men were moved to the south area for a short period of time to investigate a small section of the "houses." It was only two days before the cessation of work that the structures were definitely recognized as tombs.

The tombs are rectangular, ranging in size from 1.30 by 2.10 m. to 2.65 to 3.00 m. Generally each room is a complete unit with its wall adjacent to the next one, only a few having one wall in common. There are narrow streets separating groups of tombs. The tombs are usually constructed of coarse volcanic cinder block, but the outside walls on the streets are of cut limestone. Toward the bottom each course below is stepped out a few centimeters. We nowhere reached bottom in either street or tombs, though we dug down more than two meters below the tops of the walls. There are no doors or windows except what had been broken into the upper parts of some walls for habitation in later ages. These tombs are essentially similar to one type of tomb found in the cemeteries of Beiḥân. These were groups of shaft tombs constructed of local stone, and were probably slightly smaller than these at Mârib. The other type of tomb in Beiḥân was a mausoleum in which the corpses were inserted endwise into pigeon-hole compartments from a central aisle. They were constructed of the same local stone. While differing somewhat in plan and detail, they are essentially the same as the elaborate mausoleum at Mârib.

The value of both excavations, at Beiḥân and at Mârib, less then fifty miles apart, is greatly increased by the possibility of comparison. The one was in Qatabân, the other in Saba. They had similar cultures, but with local differences when both were not under one rule. The Beiḥân excavations were carried out by the *American Foundation for the Study of Man* during 1950 and 1951 and are to be published by the expedition members who did the work. One of the most difficult problems of both excavations was that of chronology. Mârib chronology depends greatly on inscriptions—their content and palaeography—as well as on comparison with the Beiḥân finds.

The city of Mârib has fifty to seventy-five feet of stratified deposit but, unfortunately, we did not dig there. At Ḥaram Bilqis we had no stratigraphy. We had very little pottery, and what we had was mostly local ware of simple sorts. We found almost no imported objects and few objects with recognizable foreign influence.

The introduction of the Moslem religion may be accepted as a terminal

FIG. 7. Bronze dedicatory statue 39 cm. tall with inscription across the front.

date for the Himyarite temple, and it is quite possible that the people, whose number and living standards diminished rapidly and greatly after the bursting of the dam in the mid-sixth century A. D., found the temple rather large and expensive to keep up even before that date. The temple was originally built in the eighth century B. C.

Of particular interest are the bronze statues, which Dr. Jamme dates in the eighth or early seventh centuries B. C. because of their script and other evidence to be published later. Stylistically that date is also justifiable.

A bronze statuette, 17.5 cm. high with the feet missing, showed very strong late Hellenistic influence. It was locally made of the same bronze as the other statues and plaques, coated with a powdery light-green patina and breaking with a dark red fracture. Like the other statues, too, it was cast over a core of pressed carbon. It was the statuette of a woman standing in a "hip-shot" position and wrapped in garments of various textures. At first glance the stance and garments looked convincing enough but soon one noticed that the weight was carried by the left leg and therefore the left hip was raised but that, quite unnaturally, the left shoulder was also raised and the right lowered. And the folds and convolutions of the garments were quite impossible to trace. The artist had seen and admired Greek work and had copied the idea but entirely missed all Greek logic.

A large number of terra cotta statuettes was found but they were only votive models about 9 to 12 cm. tall, very crude hand-made seated women with knobs for heads, short stubs projecting sideways for arms and similar stubs projecting forwards for legs.

We hope to bring out a complete publication of the Yemen Expedition as soon as possible. But since we are now planning another expedition into unknown neighboring lands, it is thought most advisable to print this sketch, written in the field.

NOTES ON THE TEMPLE 'AWWÂM AND THE ARCHAIC BRONZE STATUE

Dr. Frank Albright's partial excavation of the great Temple of the Moon at Mârib (the modern Ḥaram Bilqis, on which see Adolf Grohmann in the *Encyclopaedia of Islam*, III, pp. 283 ff.) is a contribution of the highest value to South-Arabian archaeology. It was already known that the wall of the oval enclosure goes back to the reign of the second known *MKRB* of Saba', Yadi'-'il Dhirrîḥ, son of Sumuhu-'alay, in the early eighth century B. C. The original installation here is presumably much older. The sanctuary described above in detail must belong to a later period, presumably to the first century or so of the Monarchy (cir. 450-350 B. C.), judging from Qatabanian parallels in construction from the Achaemenian age. Its contents are in part still earlier, as is probably true of the archaic bronze statue.

The closest parallels to the bronze statue, wearing a lion's skin (Fig. 7) come from the *favissa* (storeroom or repository for rejected objects) of Marathus ('Amrit) in Phoenicia. Situated on the mainland southeast of Aradus (Arvad), this cache of broken statuary was excavated by Maurice Dunand in 1926, and has since been

published by the same indefatigable scholar (*Bulletin du Musée de Beyrouth*, VII [1944/45], 99-107 and plates XIV-XXIX; VIII [1946/48], 81-107 and plates XXX-XLII, with continuation to follow). Here Dunand has published nearly a score of broken statues representing the beardless Heracles wearing loincloth or tunic, with a lion's skin fastened over his shoulders so as to cover his back (cf. especially plate XIX: 16-17 and the following plates). As shown in detail by Dunand (VIII, pp. 94-100), these figures represent the youthful Baal Melcarth, lord of Tyre, Citium in Cyprus, and Aradus in northern Phoenicia, identified with Greek Heracles; they belong to the period between the seventh and the third or second centuries B. C. The earlier cult of Baal Melcarth has been discussed by the writer in BULLETIN, No. 87 [1942], 29; his point of view has since been confirmed by a number of important discoveries (e. g., Seyrig has shown that Melcarth was identified with Nergal in the Roman period). The cult of Melcarth was dominant in Phoenicia and lands under strong Tyrian influence in the ninth century B. C.; it may have been then that the type was borrowed by the South Arabians in connection with their extensive caravan trade with Phoenicia. The boustrophedon inscription cannot be later than the fifth century B. C. and the date in the eighth or seventh century suggested by A. Jamme and Frank Albright, in accord with epigraphical and stylistic indications, appears most reasonable to me. I should prefer the seventh century, since our statue is in no case a slavish imitation of a Phoenician original, but shows signs of independent South-Arabian development after the original borrowing about the ninth century (?) B. C. This statue is certainly the earliest such object from South Arabia about whose date we can speak with any degree of confidence.

W. F. ALBRIGHT

THE CHALDAEAN INSCRIPTIONS IN PROTO-ARABIC SCRIPT

W. F. ALBRIGHT

In 1927 the late Eric Burrows, S. J., published a group of several short inscriptions in proto-Arabic script from Sir Leonard Woolley's excavations at Ur in southern Babylonia.[1] The longest inscription, containing twenty characters (Fig. 1), had been discovered under the pavement of Nebuchadnezzar II (604-562 B. C.) at the shrine of E-nun-makh; it could not, therefore, be dated after the early years of the sixth century at latest. Other objects found under the same pavement included a Phoenician inscription on an ivory box lid, which the forms of letters date to the seventh century B. C.[2] Burrows recognized that the seven letters at the top are an awkward copy of two groups of letters from the text at the bottom, and thought that they represented an unsuccessful preliminary effort; it seems more likely to me that they were scrawled by an illiterate person afterwards. He read the lower inscription correctly left to right (line 1) and right to left (line 2); it is thus boustrophedon in the opposite direction from that prevailing in South Arabia during the eighth-fifth centuries B. C.[3] In reading the individual letters he was

[1] *Journal of the Royal Asiatic Society*, 1927, pp. 795-806.

[2] *Ibid.*, pp. 791-794. On the building E-nun-makh see Gadd, *History and Monuments of Ur* (London, 1929), pp. 231 f. and *passim*.

[3] For the chronology of South Arabia see especially my discussion (after the first campaign of 1950 in Qatabân) in BULLETIN, No. 119, pp. 5-15. The results of the much more extensive work in 1951 and of the campaign of 1952 at Mârib in Yemen (the ancient Mariaba, capital of Sheba) have modified this chronology slightly,

less successful: (1) *DNGY ZBL K* (2) *DR GŚN*, "Dungi bearer of tribute . . ." We shall return to this in a moment.

The second inscription considered by Burrows is unintelligible and perhaps does not belong here at all, but the third inscription (Fig. 2) is again clear.[4] It runs from left to right like the first one, and was

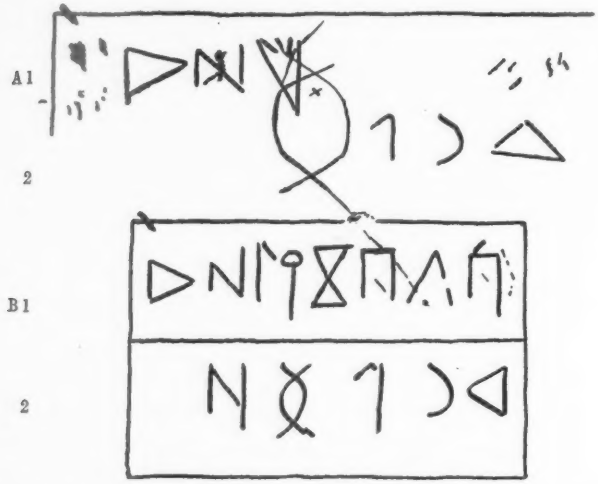

FIG. 1. Inscription from below pavement of Nebuchadnezzar at Ur. (After Eric Burrows, S. J.)

correctly deciphered by G. R. Driver: *KRŚ NF(P)ḪY*, Kirsu (?) the smith." The word for "smith" is clearly a loanword from Babylonian *nappāḫu*, and corroborates Burrows' clever recognition of Babylonian *zābil kudurri* [5] in the first inscription. We seem to be dealing with inscriptions belonging to a language which borrowed extensively from Accadian.

as will be shown in detail elsewhere. Timna', capital of Qatabân, was destroyed about 25 B. C. (instead of 50 B. C.) and the beginning of the dual monarchy of Saba' and Dhû Raydân must be placed nearly a century later than the now generally accepted date cir. 35 B. C. King Shahr Yagil Yuhargib, the most powerful ruler of Qatabân, may be dated about 75-50 B. C. instead of about the third quarter of the second century B. C., and the end of the Minaean state then comes down to about the third quarter of the first century instead of the last quarter of the second. There is, on the other hand, no reason to change the approximate date of the establishment of the Sabaean monarchy from cir. 450 B. C.—which I learn from A. Grohmann in Cairo to have been Rhodokanakis's last preferred date for the same event. The emergence of the earliest yet known *mukarribs* of Sheba is fixed by Assyrian synchronisms to the early eighth century B. C.

[4] See Burrows, *loc. cit.*, pp. 801 f.

[5] The expression scarcely means "bearer of tribute," as stated by Burrows, but rather "bearer of the allotted burden of work, person engaged in obligatory labor." It is not quite synonymous with "person subject to the *corvée*."

The second piece was found on the surface, and throws no light on the date, but there can be no doubt that the two belong together, in view of the fact that the letters face in the same direction and that both share the peculiar form of *N*, otherwise not attested in proto-Arabic script.

Returning to the first inscription, we note that the reading *Dungi* is quite impossible. Even if we accept the antiquated reading *Dungi* against probable *Šulgi* for the name of the second king of Ur III, who flourished in the late 21st century B. C. (low chronology), we are still faced with unparalleled recurrence of this Sumerian name after nearly 1500 years. Burrows should have noted that the position of letters in this script was not rigorous, as illustrated by *L* in the partial copy of these two lines above and by *N* in the seal to which we shall turn next. The two supposed occurrences of *G* are identical in form with the one recognized *L*—only the stance is slightly different. We then read simply: (1) *DNL YZBL K* (2) *DR LŠN*, "Danil has performed the required service (? will perform service)[6] for Sīn." Since we are in the temple area of Sīn, chief god of Ur, this is the obvious rendering of our text. *Danil* is the Babylonian pronunciation of non-Accadian Semitic

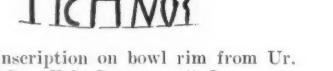

FIG. 2. Inscription on bowl rim from Ur.
(After Eric Burrows, S. J.)

Dan'il, "Daniel,"[7] and *Sīn* (with initial *samekh*) is the correct form of the name of the moon-god in standard Accadian.[8] In other words, we have in this short inscription two good cuneiform proper names and two good Babylonian words. That the basic dialect is not Accadian is shown by the initial *Y* of the verbal form and by the preposition *L*, Accadian *ana*. In the second inscription we have a name which is scarcely Accadian,[9] and the Accadian word for "smith."

[6] The tense indicated by the imperfect in "Chaldaean" is naturally uncertain.

[7] The name *Danilu*, *Dan'el* is well attested (in different writings and perhaps with different meanings attributed to it) in Old Assyrian, Old Babylonian, Northwest Semitic (Ugaritic *Dan'el*); in our period it is found, e. g., in late Assyrian documents (Tallqvist, APN 69b) and late Babylonian documents (Tallqvist, NBN 52). The hero of the Book of Daniel flourished precisely in our period.

[8] It seems now to be established that the name was pronounced identically in the Babylonian and Assyrian dialects (cf. *ŠNḪRB* = *Sīnaḫḫēriba* and *ŠMGR* = *Sīnmagir*), presumably because the name was taken over from Sumerian after the dialectal shift of sibilants was already completed. The original uncontracted Accadian form of Sumerian *Zuen* is not known, but may have been **Zuyen* > **Ziyen*, from which the Ḥaḍramī name of the moon-god, *ŠYN*, was borrowed at a very early date—how is unknown. It should be noted that Sumerian *z* is regularly reflected by Accadian *s* in borrowed words, and that the Ḥaḍramī word cannot be transcribed *Sīn*, as customarily done, but had three consonants.

[9] Driver may be right in identifying it with the doubtful *Kir-su*[?] of Tallqvist, *Assyrian Personal Names*, p. 116, and the equally dubious *Kirsi-Marduk* of Clay, *Personal Names of the Cassite Period*, p. 100, but even if these names really existed the sibilant may point to a native Chaldaean (i. e., proto-Arabic name).

A third inscription belonging to the same group is a hitherto misunderstood cylinder seal (Fig. 3), of typical Babylonian (not Assyrian, as shown by such details as the feather headdress) character from the late eighth or seventh century B. C.[10] A later date has been mentioned, but is quite impossible, as shown by the costume and other details of execution.[11] Previous treatments by D. H. Müller, F. V. Winnett, and other scholars have started from the natural assumption that the script of this seal is related to that of the earliest hitherto known proto-Arabic inscriptions from North Arabia, called "Dedanite" by Winnett.[12] It has thus been read *inter alia* (1) *DBRK BN* (2) *'R'*, which cannot be right, since no names remotely resembling these consonantal groups are known. We must read it left to right (line 1) and right to left (line 2), in the same boustrophedon style as at Ur, and identify the triangles as *D*. It is true that *R* is turned in the same direction in both lines but the *N* and *K* face in the opposite direction to what would be expected in any other proto-Arabic script not written boustrophedon, showing clearly that the stone-cutter was not quite sure of the directions of his letters. The same thing happens often in peripheral or not entirely literate South-Arabian inscriptions. Note also the unusual position but normal "Chaldaean" form of *N*, as well as the vertical line following the last letter of line 1, which is not necessary for *D* in this script but divides the name from the following one. We then read: (1) *NBKRBD*. (2) *DRD'*. As might be expected, we have here two Babylonian names, *Nabū-kiribdi* for *Nabū-kiribt(i)*[13] *-išmē* (literally, "Nabū Has Heard

[10] There can be no doubt of this date or provenance, which I have discussed with several connoisseurs, including most recently Dr. Elie Borowski. The seal is said to have come from the region of 'Anah on the Middle Euphrates.

[11] Cf. Winnett, *A Study of the Lihyanite and Thamudic Inscriptions* (Toronto, 1937), p. 49, for Meek's proposal, and Werner Caskel, *Das altarabische Königreich Lihyan*, pp. 8, 24, n. 10, who dates the inscription centuries after the seal.

[12] *Op. cit.*, pp. 49 f. and Pl. VIII. Nos. 2 and 3 are certainly North-Arabic, not "Chaldaean." On the other hand, the three Babylonian seal cylinders illustrated by Ward, *The Seal Cylinders of Western Asia*, p. 353, Nos. 1209-1211, seem to run from left to right and several letters have forms agreeing with those of our "Chaldaean" inscriptions (e. g., *D*, *'*, *F*), but I can suggest a plausible reading only for No. 1209: *Pīruballiṭ*, which would be a hypocoristicon of familiar type, for some such name as **Sîn-pîr-uballiṭ*, "Sin Has Given Life to Offspring" (cf. NBN 328a). Since the last letter has the value *ṭ* in Thamudic A according to Winnett and the Dedanite *Ṭ* is very similar, this reading seems reasonable. Ward No. 1211 reads clearly *ŠBLD'*, with the same ending as *DR'D'* in Ward No. 1207 (our Fig. 3); a possible interpretation of the name is *Šûb-la-Ada'*, "Repent, O Adad," with a form like *Rûm-la-Yâhû* (BULLETIN, No. 123, p. 28).

[13] The hypocoristic name *Kiribtu/i* was extremely common in eighth-fifth century Babylonia; cf. Tallqvist, APN 115 f., and *Neubabylonisches Namenbuch*, p. 91a (17 occurrences). A name like *dNa-na-a-SIZKUR* (ZA IX, 398, line 10) can scarcely be pronounced otherwise than *Nanai-kiribtī*, "The Goddess Nanai (has heard) My Prayer," or "O Nanai (hear) My Prayer." The full form of our name appears in contracts from the reigns of Nabopolassar and Nabonidus as *dNabû-kiribt(i)-ši-me* (*SIZKUR* may, of course be also read *karabi* as in *Sîn-ka-rab-iš-me* [ZA VII, 190] from the reign of Merodach-baladan in the eighth century) see Strassmaier, *Nabonidus*, No. 270: 7 and *Nabopolassar* (ZA IV, 146, line 9). *Nabû-SIZKUR* and *Nanai-SIZKUR* are very common among names published subsequently, e. g., by Dougherty, *Goucher College Cuneiform Inscriptions*, II, pp. 48, 50 f., from the seventh and sixth

My Homage"),[14] and *Dūr-Ada'* for *Dūr-Adad* (literally "A Fortress is Adad").[15] We must probably render "Nabū-kiribti (son of) Dūrada'."

There are probably other seals of this same class; in n. 12 I have pointed out some possibilities, one in particular (Ward, No. 1209). Two

FIG. 3. After reproduction by D. H. Müller, *Epigraphische Denkmäler aus Arabien* (Wien, 1889), Pl. 5 (Enlarged).

graffiti from Hamath, published by Harald Ingholt,[16] both antedating the destruction of the city by the Assyrians in 720 B. C., look to me like proto-Arabic scrawls of Northwest-Arabian type.[17] The two letters on a jar of the late eighth century or so, discovered by Nelson Glueck at

centuries. While *SIZKUR* does not seem to be given the reading *kiribtu* as explicitly as the older favorite forms *karābu* and *ikribu*, the mere fact that the ideographic writing *SIZKUR* is so common and that the word group *KRB* appears nearly always in phonetic spelling as *kiribtu* seems decisive. The partial assimilation of *t* to the preceding *b*, becoming *d*, has a large number of parallels among the Aramaic and Hebrew transcriptions of cuneiform names in the eighth and seventh centuries B. C.

[14] On the names of all periods incorporating an element from the stem *KRB* see Stamm, *Die akkadische Namengebung* (largely after Landsberger), pp. 122, 158, 180, 192, 204, 274. It might be added that the basic meaning is ambiguous, and that like Hebrew *ḥésed*, it varies between the complementary senses of "greeting, blessing (for inferiors)" and "greeting, homage (toward superiors)."

[15] The name *Dūr-Adad* appears twice in seventh-century texts indexed by Tallqvist, APN 71 ff., along with *Dūr-Aššūr*, *Dūr-Ištar*, etc. The hypocoristic *Dūra'* appears in Tallqvist, NBN 55a (*Du-ra-a* and *Du-ri-ia* for *Dūri-Ištar*, or the like) and Dougherty, *Records from Erech, Time of Nabonidus* (*Yale . . . Babylonian Texts*, VI), No. 203: 9 (*Dūr-a*).

[16] *Rapport préliminaire sur sept compagnes de fouilles à Hama en Syrie* (Copenhagen, 1940), Pl. XXXIX, Nos. 6-7.

[17] The names are *possibly* to be read *'Afšaḫ* and *YLḪ*; the *Ḫ* at the end of both names is plausible.

Tell el-Kheleifeh (Ezion-geber),[18] are probably proto-Dedanite, as I shall show in an article on "Dedan" which is planned for the Albrecht Alt *Festschrift*; in no case are they Minaean, much less "Chaldaean."

The term "Chaldaean" is obviously correct. No other people which settled in Southern Mesopotamia in the first centuries of the last millennium B. C. became so thoroughly babylonianized by the eighth century B. C. as to bear prevailingly Accadian personal names and to show all other indications of complete acculturation to Babylonia. In fact the Chaldaeans were almost "completely Babylonian in religion, language, and culture" as far back as we can go in their history—i. e. to the middle of the ninth century, when they first appear in the inscriptions of Shalmaneser III.[19] There can be no doubt that the Chaldaeans first settled on the shore of the Persian Gulf on both sides of the mouths of the Tigris and Euphrates, as well as in the marshes further inland. They then pushed into the open plains of Babylonia, occupying the ancient cities of Ur, Eridu, Erech, Larsa, etc., from which Sargon II briefly dislodged them toward the end of the eighth century.[20]

It has generally been supposed that the Chaldaeans came from East Arabia along the shores of the Persian Gulf, from which they infiltrated into Babylonia in the course of the tenth and ninth centuries B. C. However, there was no evidence other than intrinsic probability. In the late summer of 1952 Dr. Frank P. Albright,[21] directing the current campaign of the American Foundation for the Study of Man (headed by Dr. Wendell Phillips) in the district of Ẓofâr near Ṣalâlah in western 'Omân, discovered an inscription which appears to be older than the usual material of Ḥaḍramī origin and Roman date which he has been turning up in this area, never before archaeologically explored. The inscription runs from left to right and contains a triangular *D*, exactly like the "Chaldaean" *D*.[22] The double coincidence is very striking, especially since neither is found in normal South Arabian script from the eighth century B. C. on down. The natural inference is that Frank Albright has come upon the first example of the alphabetic script of 'Omân in Himyarite times. Though it does not appear to antedate the 2nd century B. C. and probably dates from the 1st century A. D., it seems to explain the source of the "Chaldaean" script: the latter was brought north from an undetermined part of East Arabia, to which it had spread

[18] See Glueck, BULLETIN, 71, pp. 15 f., 18, and 79, pp. 12 ff.; *The Other Side of the Jordan*, p. 107; Ryckmans, *Revue Biblique*, 1939, pp. 247-249. Ryckmans thinks that they are Minaean monograms, but they are much too early to be Minaean and I know of no monograms in pottery graffiti of this type.

[19] Dougherty, *The Sealand of Ancient Arabia*, p. 69.

[20] *Op. cit.*, p. 52.

[21] Not a relative of the present writer, though he was a student of mine. He received his doctorate in archaeology from D. M. Robinson, with whom he collaborated in the excavation and publication of Olynthus.

[22] This discovery illustrates the impossibility of the Aegean connections proposed by Eric Burrows, *op. cit.*, pp. 802-806. His preferred date for the Ur inscriptions discussed in this paper is in the tenth or ninth century B. C., which is in any case two or three hundred years too early.

from 'Omân.[23] It is true that the inscriptions hitherto found in the region of el-Ḥásā, opposite Baḥrein, are in normal Sabaean characters,[24] but they are in any case much later than the date of the extant " Chaldaean " inscriptions, and very much later than the date of the migration of the Chaldaeans from the south into Babylonia. It may be added that the left-to-right direction of the script was characteristic of some of the most archaic graffiti yet discovered by Father Albert Jamme in the Qatabân area, which must go back at least to the eighth century B. C and possibly to the ninth or tenth.[25] In the first centuries of the last millennium B. C. there seems to have been a Sabaean trading hegemony (possibly even a commercial empire of sorts) over the entire southern and western parts of Arabia, if it was not still more extensive.[26] It was presumably during this period that the left-to-right direction of the script spread to 'Omân and possibly across the Red Sea into Abyssinia.[27]

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[23] For close association between the Arab settlers in 'Omân and Babylonia we may refer to the discussion by Baron von Oppenheim, *Vom Mittelmeer zum persischen Golf*, II, pp. 333 ff.

[24] Cf. R. LeB. Bowen, *BASOR Supplementary Studies*, Nos. 7-9, pp. 23 ff.

[25] These graffiti come both from Wâdī Beiḥân and from the Mukeiras area between Beiḥân and Aden; cf. for the present A. Jamme, *Académie Royale de Belgique, Bulletin de la Classe des Lettres* etc., 5e Série, Tome XXXVII (1951), pp. 315, 319.

[26] For the Sabaean domination of Qatabân in the time of the earliest graffiti see Jamme, *loc. cit.*, pp. 309 ff., and *Pièces épigraphiques de Ḥeid Bin 'Aqil* (*Bibliothèque du Muséon*, Vol. 30, Louvain, 1952), pp. 171, 189 f. The work of our expeditions in 1950-1952 has made it very difficult to assume a nomadic Saba' (Sheba) as late as the tenth century, and the story of the Queen of Sheba's visit to Solomon need not be any less historical than the rest of the acts of Solomon, which have again and again been confirmed in recent years. It may be added that paramount queens are not only well attested in North Arabia as far back as the eighth century B. C. but also in East Arabia (*Bâzu* = *Bûz*) as far back as the early seventh—i. e., from the beginning of our Assyrian information about Arab rulers. For the background of the early Sabaean commercial expansion, which certainly carried its traders into Africa, see my discussion, *Archaeology and the Religion of Israel* (1942), pp. 132-135, as well as the remarks of G. Van Beek, *Biblical Archaeologist*, XV, 1 (1952), pp. 5 f.

[27] A number of the Ethiopic letters in the earliest now extant inscriptions of the early fourth century A. D. (see Littmann's table, *Deutsche Aksum-Expedition*, IV, pl. VI) offer very archaic forms, which are found already in the oldest graffiti from the Qatabân region; e. g. *M*, *F*. Other letters have positions which appear to be very archaic: e. g., *S*, *T*, *D*. Since the carliest boustrophedon Sabaean inscriptions found on the highland of Abyssinia already date from the fifth or sixth century B. C. at latest, we must evidently go still further back for the original borrowing. The Sabaean script sometimes used in the pagan Ethiopic inscriptions of the early fourth century A. D. is a bad imitation of contemporary South-Arabian script, which has nothing to do with the origins of Ethiopic writing.

SOME RECENTLY PUBLISHED BOOKS

Islamica

Father **A. S. Marmardji**, O. P., has brought out his eagerly expected *Textes géographiques arabes sur la Palestine, recueillis, mis en ordre alphabétique et traduits en Français* (Paris, Gabalda, 1951, pp. xvii + 267). This greatly needed book replaces the long unobtainable book by Guy Le Strange, *Palestine under the Moslems*, and indeed gives much more than can be found there; it is an absolute necessity for all students of the history and topography of Palestine. Marmardji draws on some 28 Arabic authors, against Le Strange's 24.

Richard Hill's *A Biographical Dictionary of the Anglo-Egyptian Sudan* (Oxford University Press, 1951 [actually 1952], pp. xvi + 392, American price $8.50) contains nearly 2000 short notices of persons connected with the history of the Sudan who died before 1948. It is naturally replete with curious information.

Reuben Levy's *The Persian Language* (New York, Philosophical Library, 1951, pp. vi + 125, American price $5.75) is issued as part of *Hutchinson's University Library of Modern Languages*. It is a remarkably successful attempt on the part of the author who is professor of Persian at Cambridge University, to make the subject interesting, with chapters on the history, civilization, and literature of the country.

Three very interesting books dealing with recent times are *Near Eastern Culture and Society*, edited by T. Cuyler Young (Princeton University Press, 1951, pp. x + 250 + 16 plates, $4.00), Majid Khadduri's *Independent Iraq* (Oxford University Press, 1951, pp. ix + 291, 21 s. net), and the *Memoirs of King Abdallah* (New York, Philosophical Library, 1950, 278 pp., American price $3.75). In the first volume such scholars as Richard Ettinghausen, G. von Grunebaum, Arthur Arberry, George Sarton, Edwin E. Calverley, Adnan-Adivar, Habib Kurani, Lewis V. Thomas, Constantine Zuraik, and H. A. R. Gibb have joined with the editor to produce an unusually good symposium. The second is a masterly account, by a Johns Hopkins professor, of Iraqi politics and history since 1932. The third is unique in being the late King Abdallah's own story of his life; translated by G. Khuri and edited by Philip Graves (the famous London Times correspondent in the Near East), it can be trusted to be a correct reflection of its author's view of his career and the history of Transjordan with which it was so closely bound.

The three parts of Vol. II of **Henry Field's** standard treatise on *The Anthropology of Iraq* were issued in 1951-1952 (*Papers of the Peabody Museum of American Archaeology and Ethnology*, Harvard University, Vol. LXVI, pp. ix + tables 9-194 + plates 6-54 [quarto]; pp. ix + 174 + tables 1-187 + plates 1-76; price $6.50 and 6.85, respectively). The plates contain front and side photographs of each of several hundred subjects, together with a certain amount of miscellaneous material illustrating modern Iraq. We congratulate the author on completing this volume.

Dr. Field has also published *Contributions to the Anthropology of the Faiyum, Sinai, Sudan, Kenya* (Berkeley, University of California Press, 1952, 352 pp. in photo-offset form). This volume is a publication of the University of California African Expedition, led by Wendell Phillips; besides physical anthropology it contains much miscellaneous anthropological, geographical, and archaeological material. The reviewer was a member of the Sinai expedition, and welcomes this useful addition to our information; he himself is conscious of not having published a number of long-promised studies on the results of the expedition.

W. F. Albright

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THE ANNUAL (edited by F. V. Winnett); Vol. XXIX will deal with J. L. Kelso's work at Jericho. Vols. I-IV, XVII, XX are out of print; prices for the others will be quoted on request. Nelson Glueck's *Explorations in Eastern Palestine, IV,* appeared this spring in two double volumes, price $12.00.

THE JOURNAL OF CUNEIFORM STUDIES (ed. Albrecht Goetze) a scholarly review of the literatures, languages, and cultures of ancient Mesopotamia and the surrounding countries, $6.00 a year. Individual issues cost $1.75.

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TEXTS. JOINT EXCAVATION WITH HARVARD UNIVERSITY AT NUZI (Published by Harvard University Press). Vols. I-III, $6.00 each, Vol. IV, $5.00.

EXCAVATIONS (Harvard University Press). *Nuzi, Report on the Excavations at Yorgan Tepe near Kirkuk, Iraq.* R. F. S. Starr. Vol. I (Text) $5; Vol. II (Plates) $10.00.

GERASA, CITY OF THE DECAPOLIS, ed. C. H. Kraeling. 1938. $10.00.

THE OTHER SIDE OF THE JORDAN. Nelson Glueck, 1940. $1.50 (lithoprinted).

WHAT MEAN THESE STONES? Millar Burrows, 1941. $1.50 (lithoprinted).

MATHEMATICAL CUNEIFORM TEXTS (Published jointly with the American Oriental Society). Ed. O. Neugebauer and A. Sachs. 1945. $5.00.

TELL EN-NASBEH. (Published jointly with the Palestine Institute, Pacific School of Religion.) Ed. C. C. McCown. 1947. Vol. I, $12; Vol. II, $8; the two volumes together $18.75.

DEAD SEA SCROLLS, ed. Millar Burrows, 1950 Vol. I, $5.00; 1951 Vol. II, 2nd fascicle, $2.00; fascicle 1 in preparation.

THE SONG OF ULLIKUMMI. H. G. Güterbock, 1952 (reprinted from JCS). $2.00.

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